THE MONTHLY JOURNAL

OF

MEDICINE.

VOL. VI. OCTOBER, 1825. No. XXXIV.

(From the London Medical Repository.)

Observations on the Treatment of Pulmonary Disorders. By A. RENNIE, Esq., Surgeon, &c.

(Concluded from page 129.)

Too many facts cannot be supplied in confirmation of any principle in therapeutics, and therefore it is hoped that no apology is requisite for the following details in farther illustration of the beneficial influence of animal and invigorating diet in several pulmonary diseases.

B., aged twenty-eight, middle size, stiff, contracted chest, dark, florid complexion, scrofulous diathesis; for some months past has been gradually losing flesh. Complains of fever in the evenings, wakefulness and perspirations towards morning: very short breathing; tight, hard, husky cough; occasional pains in the chest, with sense of constriction and pressure over the sternum. Appetite deficient; pulse above 100, irregular; unable to speak quickly, to laugh, inspire deep, or walk fast, without exciting coughing.

Within eight days back experienced more than usual pain at chest, after exposure to cold, with some shivering and fever; next morning expectorated blood mixed with white purulent matter; expectoration continues, with fever, perspirations, languor, lassitude, and progressive emaciation.

Under these circumstances antiphlogistic measures were

prescribed, without depletion, consisting of counter-irritants, diaphoretics, and alterative evacuants, as under :—

℞ Pil. Hydr. gr. iv.
Pulv. Jac. V. gr. ij.
—— Digit. gr. j. M.
Ft. pilula, omni nocte sumenda.

℞ Potassæ Sulph. ʒiv.
Antim. Tartariz. gr. ij.
Infus. Sennæ ʒiss.
Tinct. S. Comp. ʒiv.
Aq. Pulegii ʒij.
Spir. Lav. Comp. ʒiij. M.
Ft. mist.; capiat cochleare amplum omni hora usque ad nauseam.

As soon as the gastric, hepatic, and alvine functions were regulated, (anodyne diaphoretics, for the pectoral symptoms, having been interposed between the alterative medicines,) this patient was put upon an invigorating diet and sent into the country. In three months he returned free from every bad symptom, and so completely restored to *embonpoint*, that the circumference of the body was enlarged several inches.

S., aged twenty-seven, broad, large chest, has lived very hard, being accustomed to late hours, excesses in wine, &c. In the spring of 1823 he was seized with pulmonic inflammation, which was so acute as to render depletion to a very great extent necessary. The cough, expectoration, dyspnœa, with hectic fever and emaciation, remained after the remission of the acute symptoms, and gradually gained on the constitution, notwithstanding an antiphlogistic treatment of several months. When I first saw him, the symptoms were as follows :—

Considerable expectoration of purulent matter, with a loud sonorous rattling on inspiration, as if from a large internal cavity in the right lung. The liver is evidently enlarged, insomuch, indeed, as to occasion prominence of the right ribs, with hardness and fulness, extending towards the umbilical region, and much tenderness on pressure. Bowels inactive. Pulse contracted, quick, not easily to be felt. Muscular substance very much wasted; cheek flushed; countenance sallow and haggard; appetite deficient; sleep much disturbed; dyspnœa and hectic.

Treatment as follows :—Mild mercurials internally, alternating with anodyne diaphoretics of a cordial nature; constant mercurial plasters to the hepatic region, with compres-

sure; assiduous administration of animal food, adapted to existing capacities; regular evacuants, and afterwards mild tonics, with country air.

This case, after about eight months' treatment, recovered. The right side is now reduced to nearly the natural size and shape. The cough, expectoration, and dyspnœa, have disappeared for above a year. The general health and strength of this gentleman is now such as to enable him to engage in his profession.

P., aged thirty-one, middle size, thin chested, stoops, scrofulous diathesis, has been for some time pursuing medical treatment for symptoms regarded to be decidedly phthisical, for which he was directed to adhere to strict abstinence from animal food, to enjoy free country air, and to use an electuary, composed of conserv. ros. gall.; acid. sulph. dil., &c.; but he gradually lost ground.

When my attendance commenced, the symptoms were as follows: Pain, sense of pressure, and tightness at sternum; dyspnœa; constant tickling cough; expectorated matter sinks in water, in condensed granular and flaky particles; appetite deficient; bowels confined; occasional griping and diarrhœa; debility, emaciation, hectic fever, and night perspirations. Pulse above 100, tense, irregular. Very bad nights from cough.

Treatment—To adopt solid animal diet, and to use alterative evacuants of the mildest nature every third day, and anodyne diaphoretics on the intervening days: thereafter, mild tonics, a stimulating plaster to the chest, and to be frequently in the open air.

Under this system the patient's strength gradually improved, insomuch that he was shortly enabled to extend his walks to several miles. Having pursued these measures for four months, he is now vigorous, active, and healthy.

H., turned of fifty, constitutional energies much impaired, liable to habitual cough for many years, much aggravated in winter (apparently a case of chronic catarrh terminating in bronchitis,) of late has become much emaciated, and complains of night perspirations; action of the heart very irregular; flushings and alternate pallor of countenance; cold clammy skin; copious muco-purulent expectoration; dyspnœa; deficient appetite; and rapidly increasing debility.—There are tenderness in the epigastric region, costive bowels, occasional diarrhœa, coated tongue, and other dyspeptic symptoms.

Mercurials were prescribed every fourth day, with the effect

of procuring full evacuations; after which, anodyne expectorants and clothing in flannels; and, lastly, animal diet, were adopted, by which manifest improvement was attained. The sulph. quininæ was exhibited with the best effects in restoring digestive power. After three months' perseverance in these measures, general health and strength were re-established, and the cough and expectoration, which had become habitual, almost entirely subsided.

In this case, it is obvious that the system had, owing to existing disorder of the lungs and digestive viscera, lost the capacity of forming an adequate supply of arterialised and duly chylified blood, and that the waste from the debilitating perspirations could not be renovated. The change that here took place in muscular firmness and substance, in erectness and capacity of chest, and in the healthy performance of the functions of respiration, digestion, and circulation, are referrible, in a certain degree, to restoration of this deficiency. That the functional capacity both of the lungs and stomach depend essentially on the vital power imparted by the blood to their respective textures, is hardly to be questioned; and the reciprocal influences of the blood and of these organs re-acting on each other, thus produce derangements in a complicated manner and compound ratio.

The above cases are detailed principally as suggesting the following remarks on plethora:—

The doctrine that plethora is the originating cause of numerous diseases, has had, it is to be feared, a most pernicious effect in extending the use of depletion and abstinence as a means of cure. Although it appears a legitimate conclusion, that, in a disease depending essentially on plethora, diminution of the mass of blood is the natural and most effectual remedy, it by no means follows, conversely, that whenever depletion is beneficial, or even necessary, to remove any given disorder, that disorder must have proceeded from plethora, for depletion is not unfrequently advantageous when the proofs are rather against the existence of previous plethora. Though diseases which are not in any manner connected with general superabundance of circulating fluid are to be subdued by venesection, yet if that fluid be the essential material of animal life and vigour, to pursue the depleting plan, directly or indirectly, beyond the correction of the more urgent symptoms, is a practice obviously supported by no sound principle, but is repugnant alike to reason and to nature, being essentially destructive of constitutional and vital power.

That the reduction of vascular repletion and excitement

generally, or of acute action locally, and the correction of local vascular congestion, and the equable diffusion of the circulating fluid, are important objects to be accomplished by depletion, cannot be denied But depletion is not always either proper or effectual for such purposes. Disordered states of the circulation, both as to velocity and distribution, are frequently referrible to causes, which depletion and other means, acting on the same principle as abstinence, so far from removing or counteracting, rather increase, by superinducing constitutional debility and a greater susceptibility to their influence. The same measure which corrects the effect does not necessarily reach the remote cause. After correction of the effect by depletion, the continuance of the cause often reproduces the evil in an increased degree.

It appears to follow as a practical inference, that, wherever the system is inordinately disposed to the contracting of disorder requiring depletion for its removal, there is a lurking cause preying upon the system somewhere. While this is unappreciated, the continual draining of the vital fluid is a step rather apparently than really necessary. The ultimate effects of such treatment on the constitution, when systematically pursued, it is easy to foresee.

It is usual to regard persons requiring habitual depletion, as being, by some morbid tendency, peculiarly liable to contract the plethoric habit of body. The inference is very illogical. We are told, indeed, that the reproductive powers of the system in respect of the vascular fluid are increased by depletion; and if so, it is time to drop that pernicious practice, which, by abstracting the essential source of animal life, begets the necessity for its own repetition. But, though habitual depletion unquestionably induces habitual necessity for repetition of the process, it does not follow that this effect is produced in consequence of a tendency to plethora so engendered, since such apparent necessities frequently occur very urgently, without any reference to the mass of blood. It is worthy of inquiry, how far in individual cases, the peculiar constitutional condition occasioned by one depletion is not the true origin of the next occasional indication for the process, not by occasioning plethora, but by producing that debility which is inadequate to the maintenance of equable circulating velocity and distribution, in opposition to those causes to which the constitution is exposed. It merits consideration also, whether the rigid abstinence which is usually regarded as the most effectual adjunct to depletion, in the view of obviating plethora and future necessity for the repetition of deple-

tion, is not, in many cases, mainly contributive to the constitutional debility on which future irregularities of the circulation requiring depletion in reality depend. Of this practical fact I am convinced, by numerous and varied observations, that those constitutional tendencies to organic congestion, in which detraction of blood is generally considered essential, are frequently increased by abstinence and inadequate diet, pursued with the express view of prevention, and are materially counteracted by those means which are unquestionably the best calculated to reproduce the blood which has been abstracted, i. e. by a full supply of nutrient and solid animal food, administered with due regard to the functional capacities of converting it to its proper use. It is an interesting observation of Dr. Mossman (on apoplectic tendencies,) "that plethora and obesity are much more generally referrible to the use of liquid than of solid nutrient matter." That apoplectic tendencies, and other derangements of the circulation requiring depletion, are frequently to be attributed to the use of liquid diet, I am willing to admit; but not that those disordered tendencies either essentially depend on plethora, or are generally connected with absolute general excess of blood. It appears to me that the stomachic atony and relaxation induced by liquid diet is eminently calculated to diminish the propulsive energy of the heart, and thereby, especially in cooperation with other causes, contributes to those organic determinations from which plethora of the system has been assumed, and for the correction of which depletion is considered indispensable. This inference is supported by numerous facts, that might be adduced were it not a digression. The preceding cases, however, are a satisfactory exemplification of the position, as applicable to the present subject.

If there is a fever resembling hectic, and associated cough, dyspnœa, and pain in the chest resembling inflammation, which fever is induced and increased by debilitating depletions and abstinence, what must be the ultimate result of pursuing abstinence to extinguish that fever? The more rigidly and perseveringly this system is adopted, the more urgent do the fever, debility, and emaciation, become.

So long as the fever, high pulse, local pain, dyspnœa, and cough, continue, those very means are usually continued, which essentially and necessarily maintain and aggravate them. But these symptoms, along with emaciation and debility, progressively increasing, no antiphlogistic Practitioner ever yet dreamed that his own exertions were their legitimate cause. On the contrary, here are cough, pain, dyspnœa, and

fever—serious symptoms, which, whether referrible to some mysterious cause lurking in the diseased constitution of our patient, or in our own imaginations—are said necessarily to indicate inflammation and some hideous local mischief going on within; therefore, whatever be the cause, antiphlogistics must be right; and whatever come of the patient's constitutional powers, he must be bled, purged, sweated, starved, kept completely quiet, cool, motionless, and as near to inanition as possible. This is the reasoning which, if not actually expressed by the supporters of the antiphlogistic treatment, is at least adopted by them. I leave those who look closer into medical opinions than their superficial relations, to find the palpable inconsequence of the argument they espouse.

I am convinced that, under due and cautious discrimination of existing symptoms, invigorating treatment is not only indicated, but that it will produce the most favourable effects, in many cases, where antiphlogistic means are now regarded as indispensable. On the other hand, I have met with strong grounds for the conviction, that, by an injudicious and too rigid adherence to debilitating and lowering measures, whether by diet or otherwise, many occasional attacks of inflammatory and congestive disorders are converted into serious and chronic forms of disease, chiefly by being associated with constitutional debility; and that chronic catarrhs, bronchitis, congestions, tuberculous formations, and serous effusions, in particular, are legitimately to be traced to the constitutional depression so induced and maintained, especially when such occasional causes as are calculated to excite and give particular determinations to morbid action, are also in operation.

It may seem a very monstrous position to those who hold tenets leading to precisely the opposite practice, that animal and stimulating diet is at all admissible in any constitution disposed to fever and inflammatory action; but while it is necessary to guard against running counter to any incontrovertible pathological principle, by carrying such a practical deduction to an extravagant or unwarrantable application, little deference is due to opinions or doctrines, however generally received, which are incompatible with facts and irreconcileable with experience; and that the antiphlogistic system is so in a very wide class of disorders originally and intimately connected with or dependent upon inflammation, is sufficiently instructed by the facts above detailed, as well as by numerous others that might be adduced.

II.

(From Anderson's Quarterly Journal.)

The Elements of Medical Chemistry; embracing only those branches of Chemical Science which are calculated to illustrate or explain the different objects of Medicine; and to furnish a Chemical Grammar to the Author's Pharmacologia. By John Ayrton Paris, M. D. &c. &c. &c.

In ancient times the physicians were all natural philosophers; and in our own days, or those immediately preceding us, the most celebrated medical practitioners were well skilled in physics, particularly Chemistry; among whom we may mention Hoffmann, Stahl, and Boerhaave. It must be confessed, however, that the far greater number of medical men in the present day, are but little acquainted with these subjects; and indeed how can we expect that they should, when most of them are at once physicians, surgeons, accoucheurs, and druggists? The able and elegantly written work now before us, if universally diffused among the profession, as it deserves to be, will tend to make chemistry at least more generally attended to. Of such a work, so multifarious in its matter, and embracing so great a minutiæ of detail, we find it impossible to give an exact analysis, and therefore we must confine ourselves to extracts, with the interspersion of a few occasional remarks.

Dr. Paris introduces his work in rather a quaint manner, by means of a dialogue betwixt a practitioner and the author, in which he canvasses the various modes of medical education. Without chemistry he thinks no man capable of practising the profession of physic, or of discharging his duty to himself or his patient. The living power is constantly opposed to chemical actions,

"And for that reason," says our author, "it is essential to learn the nature of chemical action, before we can attempt to appreciate the extent of that force which modifies or resists it. But there are changes perpetually going on in the animal body, that are beyond the control of the living principle, and therefore the physiologist, who is not a chemist, will be utterly at a loss to comprehend them."

By means of chemistry the manufacturer adulterates our drugs; but the practitioner who is a chemist, will readily detect the adulteration. But the general diffusion of knowledge, renders chemistry actually necessary to the practitioner.

"The higher classes of society," says the author, "are crowding the lecture rooms of our public institutions, and the mechanic and artisan are becoming enlightened through the medium of chemical societies, and the extensive circulation of cheap publications. What would be the surprise of our fathers, could their spirits revisit us, to see a sectarian meeting-house crowded to excess with mechanics, to hear a chemical lecture from the reading desk! In such a state of intellectual advancement, what will become of the medical practitioner, unless he keeps pace with the general progress?"

And mere reading will never make any man a chemist.

"Without actual experiment," says the author, "it is quite impossible for a student to acquire any solid knowledge of the science. '*Nihil est in intellectu, quod non fuerit in sensu*,' was the motto which the celebrated Rouelle caused to be affixed in large characters in a conspicuous part of his laboratory, and I heartily concur in the justness of its application. With respect to the nature and extent of the apparatus which is required for the elucidation of philosophical principles, there is a very general misconception. By means of a common wooden tub, a quantity of tobacco-pipes, and Florence flasks, and a few dozen differently sized corks, with glasses and phials, I will undertake to illustrate all the leading facts in chemistry."

In some introductory remarks, Dr. Paris informs us that he has endeavoured to exclude from his Medical Chemistry "whatever has not a direct application to the study and practice of the profession." Such a division of labour has contributed largely to the advancement of science:

"And I question," says the author, "whether to such a cause we may not principally attribute that rapid progress of philosophy, which has so eminently distinguished the last half century. Physiology is certainly much indebted to an arrangement of this kind for its present extended scale of improvement; for, although the highest importance had been attached to the study of the human body from the earliest period, yet its functions were never made a distinct and separate object of inquiry, until the beginning of the last century. It is true, that the writings of the ancient physicians, and of the earlier among the moderns, abound in physiological speculations, but they are rarely brought in a connected or systematic form; so that we are obliged to collect a knowledge of their tenets, more from a number of scattered fragments, dispersed through works on medicine and pathology, than from treatises expressly devoted to the subject."

The cultivation of chemistry will render important services to the physiologist, pathologist, physician, toxicologist, and pharmacologist. The pathologist, there can be no doubt, will frequently draw important conclusions from the doctrines of chemistry.

"Although we must deeply regret," says our author, "that this department of medical knowledge, like that of physiology, should have suffered from too hasty generalization; but let no one attempt to tolerate his apathy, or to encourage his despair, by a reference to failures which have arisen, on the one hand, from a deficiency of knowledge, and on the other, from errors which are solely to be attributed to a perversion of it; let him rather seek encouragement in the contemplation of those useful improvements, which have been derived from the judicious application of chemical science, and which are daily augmenting the resources of the intelligent physician, and tending to diminish the aggregate of human suffering."

To the pharmacologist, chemistry is indispensable. It was an early conjecture, that substances which acted in a similar manner on the human body, must have a similar composition. The conjecture was a natural one; and though the results of chemical analysis were not always correspondent to it, they afforded no proof of its being false.

"Thus, in the earlier part of the seventeenth century, we find the chemists universally engaged in the analysis of the different vegetables used as remedies; many hundred plants were accordingly, for this purpose, submitted to examination, but not a single result was obtained that could, in any degree, sanction the pretensions of this science to that practical utility which theory had assigned to it; the most inert, and the most virulent vegetables, were found to afford the same products. That such a failure, however, was not attributable to the non-existence of those relations which they had endeavoured to trace, is at once rendered evident on comparing the successful results which have been obtained within the last few years, by pursuing the same principle of investigation by more perfect and less objectionable processes. Had even the experimentalists of the seventeenth century conducted their operations with all those essential precautions which it was impossible that the state of chemistry at that period could have suggested, the manner in which their analyses were performed, was such as to have precluded the chance of any useful result, for the plants subjected to examination were indiscriminately exposed to heat, and the products so obtained by their destruction, collected and rudely examined; now it is quite clear

that these products did not pre-exist in the vegetables, but were formed by new combinations of its elements; and, since these elements are in all vegetables nearly the same, we cannot be surprised, that the experimentalists should have been incapable of tracing the least connexion between them and the qualities of the substance from which they were so obtained. With equal reason and success might they have attempted to appreciate the style of a literary production, by ascertaining the letters of which its words were composed."

Dr. Paris has divided his work into three parts. In the first, he treats of matter, attraction, and specific gravity, chemical affinity, crystallization, the atomic theory, caloric, light, and electricity: in the second, of chemical nomenclature, water, oxygen, hydrogen, carbon, azote, muriatic acid, iodine, nitric acid, ammonia, Prussic acid, sulphur, phosphorus, metals, and salts: in the third, of vegetable extract, essential oils, wax, vegetable acids, vegetable alkalies, other vegetable principles, and fermentation. On the subject of animal chemistry, he has not yet entered; but we have no doubt that at some future period it will give rise, in his hands, to an interesting volume. We may add, that at the end of the work there is an appendix of useful tables.

We cannot resist the temptation of extracting one or two of our author's beautiful illustrations of the properties of matter. Of its divisibility he thus observes:—

"The marble steps of the great churches in Italy are worn by the incessant crawling of abject devotees; nay, the hands and feet of bronze statues are, in the lapse of ages, wasted away by the ardent kisses of innumerable pilgrims that resort to those shrines. What an evanescent pellicle of the metal, says Mr. Leslie, must be abraded at each successive contact! Thus again, a single grain of the *sulphate of copper* will communicate a fine azure tint to five gallons of water; in which case the copper must be at least attenuated ten million times, and yet each drop of the liquid may contain as many coloured particles distinguishable by our unassisted vision; and, if the experiment be extended by still farther dilution, so that the metal shall cease to be an object of sense, it may nevertheless be recognised by chemical tests. In the same manner, to what an extraordinary degree of division are odorous bodies reducible? a single grain of musk has been known to perfume a large room for the space of twenty years; at the very lowest computation, the musk, in such a case, must have been subdivided into 320 quadrillions of particles, each of which was capable of affecting the olfactory organs. In like

manner, a lump of assafœtida exposed to the open air, and filling the surrounding atmosphere with its effluvia, was found to have lost only a single grain in seven years.

In the same manner, striking illustrations may be adduced from the vegetable and animal kingdoms.

Porosity is a natural consequence of divisibility.

"Its existence in every species of matter which can be subjected to our senses, is sufficiently proved by the universal compressibility of bodies. There is no substance, however dense, that may not be made, either by pressure or reduction of temperature, to occupy less space; and, were it possible to bring the ultimate atoms into absolute contact, the globe itself might probably be compressed into an extremely narrow compass.

"Nor is the arrangement of the atoms of matter, which is thus indicated by its porosity, less important than its universality is obvious. It is clear that, if the constituent particles had not been so disposed in relation to each other, as to have allowed free latitude of motion, natural bodies could never have undergone those changes in form and composition, upon which their utility in the scheme of creation entirely depends. It becomes a question even, whether they could have been susceptible of change of temperature, for, if we regard caloric, as material in its nature, there would, in such a case, have been no space to have allowed its ingress; and, if we consider it as a species of vibration, it is equally evident that the atoms, without free friction, could never have vibrated, for the act of vibration necessarily implies change of place."

Under the head of gravitation, we have some curious remarks on weights and measures, and on the symbols which denote them; and here Dr. Paris has taken occasion to ridicule the attempt to substitute *unc. dr. scr.* for the ancient symbols, observing that in the work which first proposed the alteration, *dr.* is more than once printed by *mistake* instead of *gr.*

We observe that the whole subject of specific gravity is placed in a very clear light by means of diagrams; and we would recommend it to our readers, as a subject of great importance, and one from which physiology and pathology may yet derive great advantages.

In his consideration of contiguous attraction, we wish we had room for the whole of his remarks on *capillary attraction.*

"To the physiologist," he observes, "capillary attraction is a phenomenon of very great interest, for on its power depend chiefly the functions of the excretory vascular system in plants and animals; thus, says Professor Leslie, if the pores of the human skin were no finer than the three thousandth part of

an inch in diameter, they would yet be sufficient to support lymph to an altitude of 120 inches, or 10 feet, or much higher indeed, than is required for any individual. The rejection of the perspirable matter from these external mouths must occasion a continued flow of the liquid from the lower and wider trunks of the capillary vessels, aided no doubt, by a connected chain of alternate contractions and dilatations extending through their muscular structure. The pores in the leaves of trees and tall plants must be still finer, seldom perhaps exceeding the ten-thousandth part of an inch. As fast as the humidity is exhaled into the atmosphere, it is constantly supplied by the ascent of sap from the roots. Dr. Hales attempted, by an ingeniously devised experiment, to demonstrate the power of the vegetating principle, by measuring the *force* with which the sap ascended in the ramifying vessels of a growing plant; but had the same experiment been repeated, with a dead branch, the same result would have followed, provided the evaporation from its extreme surface had been sufficiently copious."

Dr. Paris next treats of pulverization, trituration, lavigation, granulation, rasping, and grating; and then of sifting, elutriation, dicantation, filtration, expression, coagulation, and despumation; all which he has illustrated with the appropriate figures of mortars, pestles, sieves, slabs, funnels, &c. &c. We give his remarks on coagulation, as a specimen of the rest.

"When," he says, "the process of despumation is effected by means of glutinous or albuminous matter, as the white of an egg, it is called *coagulation;* where the substance is not spirituous, as syrups for example, the albumen which is mixed with the fluid coagulates when it is boiled, and entangling the impurities of the fluid, rises with them to its surface in the form of gum; but spirituous liquors may be clarified with isinglass, without the assistance of heat, the alcohol, coagulating it so as to form a scum, which, by descending slowly to the bottom of the vessel, carries along with it all the impurities. In this manner it will be readily perceived, that the network of isinglass merely acts the part of a filtre, but with this difference, that in this case the filtre passes through the liquor, instead of the liquor through the filtre."

The subject of chemical affinity, upon which our author next enters, is illustrated by a series of interesting and well-devised experiments, but on this subject we must furnish only a few short extracts.

In speaking of *solution*, he observes :—

"In ordinary cases, the distinction between *solution* and *suspension*, is so well marked, that the student cannot fail to recognize it, but in others it is not quite so unequivocal, and to those endowed with a tolerable share of knowledge, it has even appeared doubtful. It is sometimes difficult to pronounce decidedly upon the existence of perfect transparency, but the fact of *permanency* can never deceive us; for in the case of mere mechanical diffusion, although it may not always be impaired by rest, it will not resist the ordeal of the filtre. In explanation of this truth, we may adduce the beautiful golden-coloured liquor, which is produced by pouring a solution of sulphurretted hydrogen into one of arsenious acid, and which, at first sight, we should not hesitate to pronounce a perfect solution; but by rest or filtration, a yellow powder will be separated, and the liquid become colourless. So again, certain vegetable matters, when diffused in water, will, from the extreme fineness of their particles, offer so small an obstacle to the passage of light, as scarcely to affect the transparency of the medium in which they float, but, by rest or filtration, such a source of fallacy is easily detected. The medical student is earnestly advised to preserve these distinctions in his remembrance, as they will form the basis of some important precepts respecting the efficacy of certain remedies, and the expediency of some particular processes instituted for their preparation."

Passing over the various processes in which the common still, the alembic, the retort, Woulfe's apparatus, &c. are employed, we come to the process of *crystallization*, by which the particles of a body are enabled to arrange themselves into determinate forms.

"It will follow," says Dr. Paris, "from what has been already stated, that in order to obtain well formed crystals from saline solutions, three essential circumstances are required, viz. *time*, *space*, and *repose*. By *time*, the superabundant fluid is wholly dissipated, so as to allow the particles of the salt to approach each other by insensible degrees, and without any sudden shock; in which case they unite according to their constant laws, and form a regular crystal; indeed it is a general rule, that the slower the formation of a crystal, the more perfect will be its form; the larger its size, and the harder and more transparent its texture; while on the contrary, too speedy an abstraction of the separating fluid, will force the particles to come together suddenly, and, as it were, by the first faces that offer; in which case the crystallization is irregular, and the figure of the crystal indeterminate; and, if

the abstractions be altogether sudden, the body will ever form a concrete mass, with scarcely a vestige of crystalline appearance. *Space*, or a sufficiennt latitude for motion, is also a very necessary condition; for if nature be restrained in her operations, the products of her labour will exhibit marks of constraint. *A state of repose* in the fluid is absolutely necessary for obtaining regular forms; all symmetrical arrangement is opposed by agitation, and a crop of crystals obtained under such circumstances, would necessarily be confused and irregular.

"The whole art of crystallizing substances is founded upon these obvious truths, as will be fully illustrated in the sequel, although on many occasions, to ensure perfect success, a certain address is required in the manipulation, which has enabled particular manufacturers to produce articles very superior to ordinary specimens.

"In the act of separating from the water in which they were dissolved, the crystals of almost every salt carry with them a quantity of water, which is essential to the regularity of their forms, as well as to their transparency and density, and which cannot be expelled without reducing them to shapeless masses. It is termed their *water of crystallization*, and its proportion will be found to vary very essentially in the different salts; in some instances constituting more than half their weight, as in the case of sulphate of soda, carbonate of soda, nitrate of ammonia, &c., while in others it is extremely small; and yet, however it may differ in different salts, it always bears in the same salt, the same definite ratio to the solid saline matter. Thus, in crystallized bicarbonate of potass, (*Potasæ Carbonas* P. L.) to every three proportionals of salt, there is one of water; while in the carbonate of soda, (sodæ subcarbonas. P. L.) to every two proportionals of salt there are eleven of water. This water appears to be in a state of combination with the salt, and not simply interposed between its laminæ."

It is not in our power to follow the author through his accurate and beautiful account of crystallization; therefore we close the subject with his concluding remarks.

"From the view," he observes, "which has been taken of the subject of Crystallization, it will appear that the structure of crystals bears no resemblance whatever to Organization. Nothing can be more different than the increase or accretion of a crystal, and the growth of an organic being; the one takes place by the mere juxta-position of new particles, mechanically or chemically applied to its exterior surface;

whereas, the other increases in dimension, by appropriating different materials for its subsistence. At the same time it would be too much to assert that there is no formation in the animal body, which derives any assistance from the operation of those affinities which bestow impulse upon the particles of inanimate matter."

Elective affinity is next illustrated by a number of ingenious experiments, and chemical diagrams. Then we have a few remarks on *re-agents* or *tests*, valuable instruments in the hands of the chemist, by which, when applied to various solutions, he detects the presence of very minute proportions of particular ingredients. The proportions in which bodies combine, and the atomic theory, are the next subjects of consideration. In every case of energetic combination, the constituents unite in proportions which are always definite; which is shown most satisfactorily in the combination of gaseous bodies with each other.

"The idea of definite proportions appears to have first struck the mind of Richter; and Mr. Higgins, in his work on phlogiston, subsequently maintained the opinion, that bodies unite chemically, atom to atom. But the generalization of the doctrine was reserved for the genius of Mr. John Dalton, who deservedly enjoys the glory of having permanently established a theory, the development of which, to use the expression of an eminent philosopher, must be considered as the greatest step which chemistry has yet made as a science; enabling us to establish principles of rigid accuracy, as the foundation of our reasoning, and to call in the assistance of mathematics to promote the progress of a science, which has hitherto eluded the aid of that unrivalled instrument of improvement. Already has the application of this theory shed a flood of lustre upon our science, not only by correcting former analyses, but by leading to the discovery of many unknown combinations, whose existence might otherwise have never been suspected."

The whole of this subject is very fully explained by Dr. Paris, but we have not room for a critical examination of it. To express the system of definite ratios, Dr. Wollaston has introduced the term *Chemical Equivalent.*

"Amongst the numerous practical uses," says the author, "to which the doctrine of equivalents may be applied, that which enables the pharmaceutist to estimate the value and strength of certain preparations, is not the least important. By such means, for instance, he may easily ascertain the quantity of real hydrocyanic acid in any dilute solution; thus,

since the equivalent number of hydrocyanic acid is exactly one-eighth of that of the peroxide of mercury, and as this acid combines in the proportion of two of the former to one of the latter, we have at once the relation of one to four in the formation of this compound. Hence it is evident, that if to a hundred grains of diluted hydrocyanic acid, we add in succession small quantities of the peroxide (*red precipitate*) until it ceases to be dissolved on agitation, the weight of the oxyde so dissolved being divided by four, will give a quotient representing the quantity of real hydrocyanic acid present. In like manner, we may estimate the quantity of real ascetic acid present in any given sample of distilled vinegar; for, since carbonate of lime and the last mentioned acid have the same representative number, it is plain that the quantity of the former, which is dissolved by a hundred grains of the sample, will represent the per-centage of real acid."

To be intimately acquainted with all the known phenomena of heat, is a matter of great moment to the chemist; and Dr. Paris has investigated them with great care. In our selections on this subject, we cannot hope for much novelty, but we will try to be interesting.

Bodies, it is well known, are either good or bad conductors of caloric.

"To this difference in the conducting power of bodies, is to be attributed the different intensity with which different bodies, at the same temperature, affect us; a fact, which in itself, must be sufficient to render us wholly incapable of appreciating the amount of temperature by our sensations; thus, if we apply the hand in succession, to a number of bodies, such as wood, iron, marble, &c. they will appear cold in very different degrees; and as this sensation is occasioned by the passage of caloric out of the hand into the body which it touches, that body will feel the coldest which carries away the heat with the greater celerity, or which, in other words, is the best conductor. For the same reason, if these bodies have a temperature considerably above that of the hand, the best conductor will be the hottest to the touch; it is thus that the money in our pockets often feels hotter after standing before the fire, than the clothes which contain it. The heat of metals at the temperature of 120° *Fahr.* is scarcely supportable; water will scald at 150°, but air may be heated to 240° without being painful to our organs of sensation. Dr. Fordyce remained for some time, and without great inconvenience, in a room heated by stoves to 260°, but the lock of the door, his watch and keys lying on the table, could not be touched without

burning his hand. It is for such a reason that we furnish metallic vessels with wooden handles, or interpose a stratum of ivory or wood between the hot vessel and the metallic handle, by which means the transfer of heat is prevented.

"The power which air possesses of abstracting heat, is likewise very little; in the high northern latitudes a cold has been experienced without injury, in which mercury froze; but if in this state of the atmosphere metalic substances were touched, the part was immediately blistered. This fact of the very feeble conducting power of air has been turned to a very useful account in a variety of instances; hence the origin and utility of double doors and double windows, which infold sheets of air between them, and so preserve the apartments at one uniform temperature. Ice-houses, are thus, also, surrounded by a stratum or partition of air, in order to prevent the warm atmosphere from entering and melting the ice. The conducting powers of air is, however, materially increased by the presence of moisture; hence the cold which is experienced in a humid atmosphere, and the sensation which is so generally felt at the commencement of a thaw, when, notwithstanding the absolute elevation of the temperature, it appears to be colder than during the frost.

"From this view of the different conducting powers of different bodies, the fitness of different kinds of clothing for their respective purposes will become apparent. Animal and vegetable substances, in general, are very bad conductors; thus, the hair and wool of animals, and the feathers of birds, are admirably adapted for protecting them from the cold, and they moreover inclose and retain air, which being a still worse conductor, enhances the effect. For the same purpose we wrap our bodies in wollen garments, and the air enclosed in their folds greatly enhances their utility; hence loose clothing is generally warmer than that which is fitted to the body; the *tight* great coat may contribute to the ornament, but not to the comfort of our persons, and is in direct opposition to the effect which it was intended to produce."

We cannot enter here into the consideration of the theories of Black, Irvine, and Crawford; but we may observe, that the *capacity* of a body for heat

"Is merely a general expression, to denote the property which bodies have of containing, *at the same temperature*, and in equal weights or volumes, certain quantities of caloric.

"Upon what this property depends has not yet been discov-

ered, nor is it, perhaps, a matter of material consequence, so long as the phenomena themselves are correctly observed and stated, it is clear that whenever the capacity of a body is augmented, there must be an absorption of caloric, and a diminution of temperature, and *vice versa*. It cannot then be doubted, but the absorption and latent state of caloric, which take place during the liquefaction and vaporization, are fully accounted for by the supposition of Dr. Irvine, by the change of capacity which accompanies these phenomena. That there should be such a change is *a priori* extremely probable; for since, as there is reason to believe, the capacities of bodies depend on certain situations of their minute particles, it is a probable inference, that when the form of a body is altered, its capacity also will be altered; and as rare bodies have in general greater capacities than those which are more dense, there is some reason to presume, that the capacity of the fluid will be superior to that of the solid, and that of the vapour or gas, to the capacity of the fluid.

"This conclusion is confirmed by experiment; for Dr. Irvine found, that the capacity of water is greater than that of ice by one-tenth, and Dr. Crawford states the capacity of aqueous vapour to that of water, as 1550 to 1000.

"To the theory of Dr. Irvine it has been objected, that if the absorption of caloric be not considered as the *cause* of the change of form, from a solid to a liquid, or a liquid to a vapour, no adequate cause is pointed out. The reply to such an objection is obvious.—It is owing to the body being expanded to a certain degree, by which its particles are so far separated, that the force of cohesion by which they were held together is diminished or overcome, in consequence of which a new arrangement takes place, it passes into the fluid or aerial form, and in such a state, as more caloric is contained in it at a given temperature, a quantity must be absorbed in order to preserve that temperature. The general question would be unequivocally decided, were it possible to determine whether the change of form precedes the absorption or extrication of caloric, or whether the reverse be the case. But this cannot he directly ascertained, since the two appear to be simultaneous; it is however more probable, that the effect of the reduction of temperature is first to change the form, and that the extrication of caloric is the consequence of this. The late discoveries of Mr. Faraday add considerable support to such a supposition, for he has shewn that the form of a body may be reduced, by merely causing the particles of a body to approximate more closely. By mere pressure, he has re-

duced gases to the fluid form. This pressure, it is evident, can have only a mechanical effect on the aeriform matter; it must merely occasion a change of form, by bringing the particles into closer contact, and can have no effect in separating caloric, where it is chemically combined. Several other facts come in aid of the same conclusion; by the mechanical compression of air much heat is given out; thus, if air be suddenly compressed in the ball of an air-gun, the quantity of caloric liberated by the first stroke of the piston, is sufficient to set fire to a piece of tinder; a flash of light is said, also, to be perceptible at the moment of condensation. This fact has been applied to the construction of a portable instrument for lighting a candle. It consists of a common syringe, concealed in a walking stick. At the lower extremity the syringe is furnished with a cap, which receives the substance intended to be fired, and which is attached to the instrument by a male and female screw. The rapid depression of the piston condenses the air, and envolves sufficient heat to inflame the tinder. When, on the contrary, air is suddenly rarified to many times its volume, its temperature falls sufficiently to sink a very sensible thermometer 50° of *Fahr.* its sensible heat instantly passing, in this case, into a latent form. This principle is well exemplified in a machine erected at one of the mines at Chemnitz, in Hungary. In this apparatus, the air within a large cylinder is forcibly compressed by a column of water 260 feet high. Therefore, whenever a stopcock, which is attached to the lower part of the cylinder, is opened, the compressed air rushes out with violence, and its expansion is so sudden and considerable, that the moisture which was contained in the compressed air is immediately condensed, and falls in a shower of snow."

We have next the author's remarks on the different methods of measuring the temperature of bodies, and on the different artificial processes by which it may be increased or diminished.

Liquefaction and evaporation are the principal methods of producing an artificial cold. With these the physician or surgeon should be intimately acquainted. Evaporation

"Is perhaps the more universal and efficacious mode of reducing temperature, and is practised different ways, in various parts of the globe; thus, in India, where the apartments are separated from their courts by curtains instead of walls, slaves are employed in perpetually sprinkling these curtains with water, the evaporation of which, when constantly kept up, will reduce the temperature of the rooms ten or fifteen degrees.

The principle of cooling by evaporation is well understood by the caravans, who cross the great desert of Arabia. These people have occasion for a large quantity of water, which they carry with them on camels, in bottles of earthen-ware, and which, in passing over the burning sands of that country, would become very disagreeably hot, were it not for the following expedient, which is universally adopted by them. When they lay in their stock of water, each bottle is enfolded in a linen cloth, and some of the company are appointed to keep these cloths constantly wet during the journey; by which means a perpetual evaporation is produced, and the contents of the bottles are preserved at a cool and refreshing temperature. In like manner, in the nights in Bengal, when the temperature is not below 50°, by the exposure of water in earthern pans upon moistened bamboos, thin cakes of ice are formed, which are heaped together and preserved underground, by being kept in contact with bad conductors of heat. At sea, wine and other liquors may be cooled, by enveloping the bottles in wet linen, and exposing them to a current of air in the sails. The *Alcarazas* of Spain, for cooling wine, act on the same principle of evaporation. These, which are very porous earthern vessels, are prepared for use by soaking them in water, for a considerable time, so as to saturate them with that fluid. Within these jars, vessels containing the wine are introduced, when the perpetual oozing and evaporation of the water cools the interior of the vessel, and consequently reduces, in some measure, the temperature of the wine or other liquor placed in it

"In our operations to produce cold by evaporation, the effect will be more striking and rapid, if we employ fluids that evaporate at a lower temperature than water; thus, æther may be made subservient, on many occasions, to the purposes of refrigeration, and this fluid, as well as alcohol, accordingly, affords the physician a valuable ingredient for the formation of cooling lotions. The frequent abuse of such applications, will afford a striking illustration of the necessity of chemical knowledge for the preparation and direction of remedies. I have known a lotion of this kind applied to the head, when the patient has immediately covered it with a flannel cap, and thus converted into a rubefacient, that which was intended to act as a refrigerant. As an instance, the converse of this, we have heard of the application of brandy to the feet, with the view of preventing the ill effects of previous cold, having occasioned, by its evaporation, such a dimunition of temperature, as to have aggravated the evil it was intended to

counteract. If we would prevent the mischief that usually accrues from wet clothes, we have only to prevent the evaporation that is thus occasioned. If a person in such a situation covers himself with a dry great-coat, he will have little occasion to fear the effects of his accident."

The methods of producing heat artificially are very numerous; but it is not necessary that we should enumerate them in this place; nor shall we enter upon the consideration of light and electricity. We must, however, extract a few remarks on the decomposition effected by electrical energy, and on the practical application of galvanic electricity.

"The fact," Dr. Paris observes, "of the transference of the elements of a combination to a considerable distance, through intervening substances, has been very ingeniously supposed capable of affording the means of eliminating calculi from the bladder. Could the functions of the part be protected against the influence of so powerful an agent, it is evident, that by a galvanic battery of sufficient intensity, a calculus composed of alkaline or earthy salts, might be transferred from the bladder by the simple introduction of a double sound, communicating on the one hand with the calculus, and on the other with two vessels filled with water, in which are plunged the opposite poles of a galvanic apparatus. This arrangement would transfer the acid constitutents into the vessel connected with the *positive* end, and the bases into that of the *negative* end.

"Nor are the effects produced by a *simple* galvanic circle, less interesting to the medical practitioner, especially in their connexion with some curious and important facts in toxicology. It has been long known, that the poisonous effects of copper utensils might be prevented by a film of tin; but it was supposed that this protection ceased as soon as any portion of the surface was abraded. Proust, however, was the first to announce the fallacy of such an opinion, but his explanation of the fact was purely chemical; from the superior affinity of the tin for oxygen; upon the same principle he stated, that no harm could arise from the alloy of tin with lead, since this latter metal cannot be dissolved by any acid, as long as an atom of tin exists. The true explanation of the fact, however, is to be derived from a knowledge of the electric relations of these metals, which the student will at once discover by referring to Table 1. (401.) where it will be seen, that tin is positive with respect to lead and that copper is negative in relation to both. For the same reason, if acid

matter be contained in a copper vessel, it will become poisonous if a silver spoon be used in stirring it, because this metal is negative with respect to copper; whereas, if a leaden or tin spoon be substituted, we shall derive a protecting influence from its action. It was by reasoning on this principle of electro-chemical agency, that Sir Humphrey Davy arrived at the important fact, that the copper of ships might be preserved from the corrosive action of the sea-water, by the juxta position of the discs of cinc, iron, or tin; in which case the muriatic acid, instead of acting on the *negative* copper, is transferred to the metal which is *positive*. The pursuit of this inquiry, has not only confirmed the justness of the views which suggested it, but it has furnished the toxicologist with a striking fact, in support of the assertion of Proust, for it has been found on trial, that when the copper is thus protected, marine insects attach themselves to its surface with impunity.

"Nor will the surgeon be excluded from his share of benefit from the discovery. Mr. Pepys has proposed to preserve steel instruments from rust by a simple application of the same principle; it will be seen in Table 1, that cinc is *positive* with respect to iron; if, therefore, a portion of this metal be inserted in a sheath, composed of some imperfect conductor, the introduction of the steel instrument will complete a simple galvanic circle of the first order, and the iron will be protected from oxydation.

"There is yet another application of galvanism to a purpose of medical utility, which deserves notice—the detection of minute quantities of *corrosive sublimate*. For this object, we have only to let fall a drop of the solution upon the surface of a piece of gold, as for instance, on a *sovereign*, and then to bring a piece of iron, as a key, in contact with both; a galvanic circle is immediately formed, and as the iron is positive, the acid will be transferred to it, and the quick silver will be deposited on the gold."

We have now arrived at the second part of the work, in which the author treats of elementary bodies and their compounds. These should be arranged according to their electrical relations;

"But in a work strictly elementary, intended for the instruction of the mere student, the great object is to lead him from known to unknown propositions, by the least abrupt steps; and above all, to avoid, in our explanations of the simpler subjects, the anti ipation of the more recondite phenomena. It is true that in many cases, such a difficulty cannot be avoided, for the objects of science are connected in a circle, and

from whatever point we start, some previous knowledge will be required. Thus, for instance, if we commence with the subject of attractions, its laws cannot be explained without a reference to the composition of substances, the names even of which may be supposed to be unknown. If, on the contrary, we commence with a history of such substances, their nature and habitudes cannot be understood without a knowledge of the attractions by which they are influenced; the same difficulty occurs in treating the subject of electricity. Without an acquaintance with the composition of several bodies, how can we exemplify the decomposing powers of this wonderful influence; and without a knowledge of this agent, how are we able to explain the history of those substances, whose composition has been discovered through its application? In many cases, however, these difficulties are but apparent, and are to be placed in competition with the numerous advantages which attend such an arrangement."

Preparatory to the consideration of elementary bodies, we have an explanation of chemical nomenclature; but we can merely give the author's closing remarks on the subject.

"In concluding the history," he observes, "of the composite nomenclature of chemistry, I may be allowed to express my strong doubts with respect to the propriety of introducing it into medical practice. Its principal value in science depends upon the assistance which it gives to the memory in distinguishing, and remembering the multiplied combinations of nature and art; in pharmacy, such assistance is scarcely necessary; our medicines are few; and dull indeed must be that student who stands in need of an artificial memory. At the same time, it is a matter of great consequence, that the names of our remedies should be unchangeable, that the physician should be able to avail himself of the experience of his predecessors with facility, and that he should read their prescriptions without the aid of a glossary. This can only be accomplished, by adopting terms that are perfectly arbitrary, and not liable to fluctuate with the tide of chemical theory."

Passing over the whole of our author's admirable exposition of water, oxygen, hydrogen, and carbon, we shall dwell for some time upon the atmosphere, a subject not less interesting to the physiologist and physican than to the chemist.

The mechanical properties, and the composition of the air we breathe are well known; and these are nearly alike in all places, unless when it is contaminated by adventitious ingredients. In ordinary cases, it is kept in a state of purity by

the equipoise of certain processes, which are constantly carrying on in the great laboratory of nature, as its vital properties depend upon oxygen.

"There have been several substances proposed for ascertaining with facility the quantity of oxygen in the air; they have been called *eudiometrical* substances; and the instruments in which they have been employed are named *eudiometers.* The value of such investigations must be obvious, when it is considered how important an influence the purity of the air we breathe, exerts upon the animal economy. Every medical practitioner ought to possess a sufficient degree of chemical knowledge to conduct such inquiries. What an accession of valuable information might we have possessed, had the Navy surgeon included in his reports, the state of the air in different parts of the ship, during the prevalence of various epidemics?"

For the purpose of eudiometry, various processes have been recommended, and our author has enumerated them with ability, and by his drawings has made it an easy matter to understand them.

Even in the driest weather, water is always present in the atmosphere, and it has great influence in the human body.

"And few subjects connected with meteorology are more interesting to the medical philosopher. How far the origin of various epidemics may be connected with it, future observations may probably discover. Increased humidity is ever attended with the sensation of cold, because the air is thus rendered a better conductor of caloric; while, at the same time, it checks the perspiration, since the atmosphere, when in a state of saturation with water, is incapable of carrying off the insensible perspiration as it is formed. For the same reason, the watery exhalation from the lungs is diminished, and various morbid effects may be thus produced. The subject has not hitherto received a share of attention commensurate with its importance. The investigation might not only lead to an explanation of many phenomena which are at present unintelligible, but to the adaptation of an artificial atmosphere for the cure of disease. It moreover deserves notice, that a humid atmosphere becomes a more powerful solvent of vegetable and animal substances. Numerous examples might be adduced to shew, that volatile bodies are sooner converted into a gaseous state, under such circumstances. It is well known to lime-burners, that the lime-stone is burnt and reduced to quick-lime much sooner in moist than in dry weather; and indeed, in the latter case, they not unfrequently place a

a pan of water in the ash-pit, the vapour of which materially assists in carrying off the carbonic acid. In like manner, camphor is found to volatilize with much greater celerity in damp situations."

II.

(From the London Medical Repository.)

History of the Theory of STAHL.

It has often struck us, that it would neither be uninstructive nor unentertaining to give a detailed history of the different medical theories which have from time to time been published to the world, and we had determined to draw up, in a short space (as at the time we thought this might be done,) a general view of such doctrines. A somewhat more intimate acquaintance, however, with the subject, has appeared to render this plan incompatible with such a detail of the respective systems, as would not make us liable to the imputation of occasional partiality. We have, therefore, preferred to lay before our readers separate papers upon the principal theories, not in any regular order, but as our own inclinations, our opportunities of procuring materials, or any other circumstances, may render convenient. Whether or not hereafter we may endeavour to form these into a regular whole, we have not yet determined; but we do not consider ourselves precluded from following this course, because we may have already published the component parts. Pursuant, therefore, to this scheme, we purpose, in the present paper, to give an exposition of the doctrines of Stahl and Hoffman, or at least of the former; and in doing this, we shall shew some very extraordinary concidences between the doctrines of Stahl and those of the late Dr. Caleb Hiller Parry. We have, however, no invidious intention in shewing this agreement; nor can any thing be farther from our thoughts than to insinuate, that Dr. Parry has made any unfair use of Stahl's writings. Our own conviction would be, that if Dr. Parry had ever read Stahl, very many years had elapsed from that time till he wrote his own elements; and that what he had drawn from that author, and what was the fruit of his matured reflection, were so amalgamated in his own mind, as not to be distinguishable by himself. In making this observation, we demand that we may not be supposed to be influenced by the irritable, and, we may be allowed to say, unfair style of criticism which has been adopted by his son, Dr. Charles Parry. We are not indeed at any time disposed to be worked upon by threats, nor harsh words, and still less when we find implicit diference to

be the only terms upon which we can be allowed to have read an author with attention, or to have been acquainted with his meaning. Our respect for the talents of the late Dr. Parry, for his industry, and his writings, is great, yet we can neither be so forgetful of ourselves, nor of the esteem due to the Doctor's own cotemporaries, as to say, that he has proved all his doctrines, or indeed that they are sustainable. These are not the days in which novelties are rejected with disdain, nor within our limited experience is the medical public, at least that part of it of which the press is the organ, the most notorious for refusing new remedies or new theories; and if indeed we believe the celebrated Burke, they even more readily adopt novel dogmata than any other class. Yet it cannot be hidden from Dr. Charles Parry, that the Elements of Pathology and Therapeutics attracted not very much attention upon their first appearance; and even upon his own shewing, the doctrines they inculcated were not implicitly submitted to. Our present business, however, is not with Dr. Parry; and we have only so far mentioned him, that our intention in placing some of his theorems by those of Stahl may not be misunderstood,—that we may not be supposed so ignoble, so utterly destitute of every high and even generous feeling, that when, like the opponents of Hervey, we can no longer deny the truth of the doctrines, we are yet determined to refuse them originality. It will be readily understood by this, that to many of Stahl's doctrines we assent, and that Dr. Parry likewise assents to them; so far are we, however, from reflecting upon Dr. Parry's candour upon this account, because he has never mentioned the name of Stahl, that we rather look upon it as confirming the doctrines, since two such competent observers have arrived at the same conclusion After all, enough will be left to shew that Dr. Parry well deserved his reputation.

Of those who quote, or rather who refer to Stahl at the present day, very few, we suspect, have ever persued his writings; and from the tone in which his name is frequently mentioned in modern books, it would seem as if he were looked upon rather as a theoretic visionary, than as an able, ingenious, and diligent commentator upon pathology, and the successful rival of Hoffman, of whom he was the contemporary and colleague at Halle. Hoffman, though older than Stahl, survived him, and left a posthumous essay, which was afterwards published by Dr. Ernest Eugene Cohausen, under the title of 'Commentarius de Differentia inter ejus Doctrinam Medico-Mechanicam et Georgii Ernesti Stahlii Medico-Organicam.' In this essay, Hoffman has very ably and very im-

partially imbodied all his great rival's doctrine, and in a style highly elegant and impressive. We know indeed no medical author to whom we would rather refer a young man, either as an example of elegant latinity or of generally good medical do trine, than Hoffman; and we can well believe him entitled to the high commendations which that great scholar, the late Dr. Samuel Parr, bestowed upon him.* Stahl asserted, in common with Aristotle, and perhaps the majority of philosophers at all times, that man consist of two parts, viz. a rational soul, and an organic body; by the soul, however, understanding the cause and principle of all the functions and actions of the human body, whether rational, vital, or natural. It may be observed here, how much, under different terms, the same helps have been at all times recurred to in aid of physiological hypotheses. Willis, who perceived that the rational or intellectual faculties were altogether different in appearance from the corporeal functions, makes two souls, a rational and brute soul, 'anima rationalis' and 'anima brutorum,'—the one common to men with the lower creation, the other peculiar to man. The different sensibilities of Bichat, though more speciously guarded, are merely similar subdivisions of that which Stahl chose to consider as one, but exhibiting different phenomena according to the instruments it had to operate with, or the substance it had to act upon; while the *materia vitæ diffusa* of Hunter again more intimately concides with the *anima* of Stahl. Not indeed that all these authors have used the same terms, but they all begin with the same general idea, branching it out perhaps according to the momentary current of their ideas when they wrote, and afterwards worked up, and completed into a comely whole. If we however, look more candidly into these different hypotheses than we customarily do, we shall probably be induced to consider them merely as means which very celebrated men have employed, to unite a series of apparently unconnected observations and facts together; and in this light, in which we are very greatly disposed to consider the theory of Stahl, we shall find much not only amusing, but profitable.

According to the chemistry of the day, Stahl considered the body composed of three badly uniting principles,—oil, water, and earth; and very liable, spontaneously or from any external cause, as heat, for instance, to run into putrefaction.

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* Dr. Parr was particularly lively in his expressions; and on one occasion, when mentioning Hoffman, he said, that 'he had read passages in his works which made him jump up to the ceiling.'

From this corruption, however, it is preserved by the circulation of the blood, and the secretory and excretory movements thereon depending, by which the most corruptible matter is continually removed from the body. Wherefore he says, life itself is nothing else than the preservation of the body from corruption, by movements, but principally by the secretory and excretory movements.

The principle of these movements, the vital pinciple, or *primum movens*, is incorruptible, immaterial, and not only presides over the acts of ratiocination, but is the proximate and immediate effective cause of the actions of the solids, of the heart and arteries, and of all those parts which perform the vital and natural functions; and while thus acting vitally, it constitutes the principle of nature of the ancients, the *anima brutorum* of Willis, or the organic life of Bichat.

In proof of the existence of such a principle, he adduces very many facts; and some of them will be very readily perceived to be of the same kind with those by which Mr. Abernethy supports the doctrine of life, as laid down by Mr. John Hunter. The language of Mr. Abernethy is, that 'experimental science has not yet informed us of more than reason has suggested, from the consideration of the general phenomena of nature, which is, that the motions and changes occurring in surrounding bodies and in our own, are the results of *some subtile substance or substances*, which enters into their composition, or acts upon them.' Now Stahl, observing that all matter is merely of itself, inert, immovable, extensible, and divisible into parts, but void of all motion, activity, or effort, follows it up by stating, what can scarcely be denied, that it is therefore necessary that *some incorporeal or immaterial active principle* be added, to induce motion and action, especially as motion itself is incorporeal, inextensible, indivisible. So far it appears to us that we can proceed safely with these authors; but in the farther development of Stahl's system, much more doubt exists. The great difficulty, and in which it so materially differs from Mr. Abernethy's, consists in his making the rational soul the directress of all the vital operations; yet it must be confessed, that he has shewn no slight ingenuity in his attempt. For he says, that the soul is the proximate and real cause of the movements in our body, is manifest from this, that at our will and pleasure we can move the joints and limbs, provided that they are properly constituted as organs of motion, and direct them to the performance of certain determinate acts and purposes. Neither is it only these voluntary acts which are under the governance of the mind, but the vi-

tal, impelling, and tonic movements of the heart and arteries, which the ready manner in which these organs are affected by the emotions of anger or terror, grief or fear, sufficiently testify. For the whole vital economy, which consists in the circulation of the blood, and excretory and secretory functions, are greatly changed, without any intervening material principle of causation, even in the soundest man. Farther, that from a perverse fancy or depraved ratiocination, the internal functions are injured, as a hair seen among food will in some persons produce nausea; a purgative or an emetic, present only in imagination, will have the same effects as if really exhibited, and the contemplation of a beautiful woman excite the venereal appetite. And lastly, he affirms that the soul is the real cause of the formation of the fœtus in utero; and he derives his proof from the circumstance of the fœtus being acted upon by the impressions of the mother, so as to be deformed or mutilated from this source, and this not only in the first, but almost in the last months of pregnancy.*

The physiologists of the time of Stahl, as also indeed many who both preceded and followed him, attributed to the brain the office of secreting an agile and most subtile fluid, by

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* On this last ground of proof, we can well believe that much scepticism may exist, most especially after the very learned and declamatory paper of Mr. Laurence on this subject, in the fifth volume of Medico Chirurgical Transactions. Nevertheless, we profess ourselves converts, in the true sense of the word, (for through many years we treated with the utmost incredulity every fact which was given us in proof) of the influence of the maternal imagination upon the fœtus. We have a very few collections upon this head, from quarters which we cannot question, and one of them in the brute creation. The instance occurred in a bitch, which, when pregnant, was frightened by a seal carried about in a basket, and several of her puppies were born with the fore legs shortened, and resembling the fins of the seal. We do not certainly state this upon our own observation, although we do not question its truth Should any one, however, think it worth while to investigate its truth, we shall have no hesitation in affording them the necessary information. Allowing, then, the accuracy of this fact, the question asked by Mr. Laurence, 'Does the same effect arise from one cause in men, and from another in animals?' is readily disposed of. Both being subjected to the same emotions, are liable to the same effects. If we may be permitted to observe upon the opinions of an individual for whose acquirements we entertain the highest respect, we should say, that he has not treated this subject with his wonted acumen, since he has supposed, that they who infer the production of some monstrosities proceeding from the imagination, maintain that this is the only cause of monstrosities. This is, however, by no means the case; and questionless, very many aberrations from perfect formation occur, not referrible either to this or any other known cause. We have said more upon this subject than perhaps we should have done, from an anxiety to rescue Stahl from the undeserved contumely with which his medical writings have been treated.

means of which the different sensations were made perceptible in the sensorium, and by which the different actions also of the body were performed. 'We see,' says M. Verduc, 'that the spirits serve sometimes to sensation and sometimes to motion, according to the diversity of the organs; and we may even say, that the spirit which is enclosed in a nerve serveth both for motion and sensation at the same time.' But Stahl had conferred all these properties upon his anima, and therefore dispenses with this use of the brain and nerves; and denies both that such a fluid is secreted, and that it is distributed to the different parts to excite sensation and motion.

Stahl taught also, that the soul, or vital principle, has an intimate knowledge of the tendency of every thing which happens either within or without the body, whether favourable or unfavourable to its preservation; and that, in consequence, certain actions were instituted, either to obviate or assist their influence; and he endeavours to prove this, partly as a corollary upon his former assertion, that the soul forms the body, and exhibits the most admirable skill in the fitting and convenient situation, configuration, structure, and texture of the parts, which could by no means occur, if it had not intention, invention, knowledge, and wisdom, and these qualities are also shewn in repairing injuries, healing wounds, and removing extravasations.

Now, the crying sin in all this, if we may be thus permitted to speak, is, in attributing intelligence in this secondary cause, for such Stahl himself considered it, referring all its properties to the great Giver of all, and acknowledging his superintendance in the whole microcosm of man. And only let us candidly consider his doctrine, as far as we have hitherto explained it; and what in fact is it more than an acknowledgement of design in the fabric of the animal body, and of which Archdeacon Paley has since made so much use in his Natural Theology? Nor, moreover, if thus looked at without prejudice, does it much vary from any other of those hypotheses, which have, at various times, had their reign over the whole domaim of nature. Mr. Abernethy, advocating the doctrine of John Hunter respecting the *materia vitæ diffusa*, applauds the great minds of antiquity, who were disposed to believe that there were invisible causes producing the alterations which are visible; and again, 'what was called the *anima mundi*, was by many considered as a distinct and active principle, and was not confounded with intelligence of any kind; whilst some used words significant of intellect, with-

out apparently having any clear ideas of intelligence :' and it is in this last number that perhaps Stahl must be ranked, and even Mr. Abernethy's own favourite and truly gigantic physiologist, John Hunter. Few persons are so little acquainted with the accusations of Mr. Laurence and his followers, as not to know that this custom of attributing design, and, shall we say, consequently intelligence, has been one of those most frequently made, and most pertinaciously persisted in, against John Hunter, and from which (what, if the difficulties of the subject were not considered, could hardly be expected,) the accusers themselves are not free. In the Lectures before the College of Surgeons, we are told that Mr. Hunter, ' in speaking of the properties of life, says, it is something that prevents chemical decomposition, to which dead animal and vegetable matter is so prone ; that regulates the temperature of the bodies it inhabits, and is *the cause of the actions we observe in them ;*' and though the language of Stahl be not precisely the same, what more does he say, in fact, but that all the functions of the living body are under the superintendence of a vital principle, which he calls the soul ? We have somewhat digressed in all this from the immediate purpose of this paper, which is to explain the doctrines of Stahl, and we have certianly done so with ' malice prepense.' For we thought that it might propitiate some little the haters of theories, and especially the wholesale contemners of the anima of Stahl, to know that a philosopher of their own day, possessed of all the knowledge which the advances of philosophy could afford him, and of such natural talent as almost, perhaps we ought to say quite, to constitute him one of the great landmarks of his age, has yet embraced similar views, and made it a great business to employ his eloquence in advocating and extending their influence. If, indeed, we are called upon to state our own opinions on this subject, we can say little more than that its importance has been overrated, both as an object of attack and defence. It is not by the existence of this principle that we can be directed, but by the different manner in which it exhibits itself in the various organs ; and in this all parties are equally agreed. We can, however, by no means bring ourselves to deny the existence of such a principle, though we hold it to be perfectly distinct from every question of politics, of morals, or religion. As we proceed, we shall find many other coincidences between some of our modern physiologists and Stahl, which, however, we must, in many instances at least, omit to mention.

Consistent with the opinion that the body is but a collection

of instruments under the direction of the vital principles, Stahl will not refer the occurrence of death to any necessity dependant upon the structure of the body, but that the Deity confers upon the human mind the *ens motus*, a definite and limited power of producing vital actions, and hence that it finally ceases spontaneously from actuating the body. On which account, the cause of life and death is not to be sought in the organic body, but in that moving principle, which at length ceases to excite the vital functions, especially if it be remembered, that so much injury is continually happening to the body, from external and material causes of disease, which the vital principle may be no more able to remove or expel. To this vital principle modifying the various functions, Stahl attributes the different temperaments.

Having thus given a very brief outline of the manner in which Stahl supposed the vital principle and the organic body to be related to each other, we proceed to the consideration of his pathology.

That doctrine which Dr. Parry has inculcated only partially, viz. that diseased actions are sometimes salutary processes,* is in the system of Stahl insisted upon as universally true. The sentient, or vital principle, has a provision against every thing hurtful, early foreseeing and endeavouring to prevent its baneful influence; and hence he states, that fevers and spasmodic affections are not pernicious in themselves and in their own nature, but are instituted by a preserving principle, for the most salutary purpose of excluding or expelling any noxious substance. Consequently, nature is the best physician; and the part of medicine is only to assist nature in her work, than to disturb which, nothing can be more dangerous.

Of all the causes which tend to produce disease, plethora† is the most frequent; so much so, that the founder of the theory we are explaining asserts it to be almost universal. For if there be too much blood, it stagnates, is obstructed, or, in modern language, congested; in time becomes, from

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* 'Thus have I endeavoured to shew—

'That many of the movements which constitute what is called disease, and which, for the time, produce disorder of the different functions, whether of body or mind, are in reality processes, the general tendency of which is to restore health and to prolong life.'—PARRY's *Elements*.

† 'The far greater number of the diseases incidental to the human frame depends, at some time or other, on that succession of antecedent circumstances which constitutes the chain of causes, on excessive momentum of blood, whether local or general.'—*Ibid.*

these circumstances, corrupted and putrid, and the abundant source of chronic or acute diseases. But as regards the actions of poisons, these are twofold : either they are so virulent, that they strike instant terror upon the governing sentient principle, and hence proceed prostrations of strength, faintings, and even death ; or they excite convulsions, vomitings, &c., which are to be considered as salutary and wholesome actions, instituted to expel the offending cause.

The sentient principle has two methods of endeavouring to obviate the evil tendency of plethora. One is by inducing increased secretory and excretory motions, and resolving the superabundant fluid into impure serum ; the other by removing the superfluous blood, in its own form, through different emunctorios, as the uterus in women, hæmorrhoids and hæmorrrhages from the nose in the opposite sex.

Nature however, wise and provident, employs different paths, according to the different ages of the individuals, for evacuating the superabundant blood. In childhood this is principally through the nostrils, in youth through the lungs, in females after the fourteenth year through the uterus, in men of more advanced age through the hæmorrhoidal vessels. And if this evacuation takes place in proper quantity and in due season, it is salutary and profitable to the body itself ; but if in either of these points it should err, very dangerous symptoms ensue : and hence is derived the mode in which particular diseases are more general in particular periods of life.

In the long catalogue of diseases which Stahl has enumer ated as proceeding from plethora, there is a great concordance with Dr. Parry, and some similarity in the explanation given of the *modus operandi*. In seeing such an agreement in the following statement, we may, perhaps, be accused of seeing more than is really meant. We shall leave this, however, to the decision of our readers, although to us both explanations seem alike, or so little different, that a similar practice may be grounded upon both.

' In youth, when the impetus of the blood is no longer directed to the head,' says Stahl, ' but rather to the chest, the vessels of the lungs being open, hæmoptysis occurs, and if from any cause this is prevented, asthma, vomicæ, pains in the chest, &c.' And Dr. Parry, after stating the manner in which asthma is most easily relieved, that ' it diminishes as soon as mucous secretion begins to take place, and is more speedily and effectually relieved by spitting of blood,' observes, ' that these facts are convincing proofs of such a pre-

ternatural fullness of the vessels of the mucous membrane of the bronchia, as to impede free inspiration, and to produce all the symptoms of spasmodic asthma.'

We shall quote one other instance of coincidence between these celebrated writers, in which language of the same kind is employed, not by any means intending that it should be understood that these are the only instances of the kind, for, indeed, it is impossible to read either author for a few pages without being strongly reminded of the other.

In speaking of local evacuations of blood, Stahl maintains that the purpose of nature is always beneficial, yet that sometimes she fails in relieving, from the evacuations not being made in proper time, place, or quantity ; and the language of Dr. Parry is :—

' Although they may relieve the part which is affected, it does not from thence follow that they restore the patient to health. It may, on the contrary, happen, that the means which, according to the laws of animal life, cure the disease, kill the patient. This is the case with regard to the effusion of blood either into the parenchyma or cells of the lungs, which often occurs in peripneumonia, and it is often true in the effusion of fluids into the ventricles of the brain in hydrocephalus. The theory of the curative principle is nevertheless just, and the process, in a great majority of cases, is beneficial to the animal frame.'

With respect to the action of external causes and of medicines upon the body, Stahl denies that they have any active qualities in themselves, but that ' they afford an external and occasional cause to the internal moving principle for instituting various determinate actions, according to its moral estimation of these things,' which is, in fact, saying only what he afterwards says in different words, that medicines have an influecne upon living bodies only, and that from their manifest and mechanical qualities no inference can be drawn of their medicinal properties ; in fact, that there are no such things as healing ointments *per se*, &c.' but that they are the excitants of living actions tending to the reparation of injuries. As might be expected, after attributing the majority of diseases to plethora, venesection he considers as one of the most valuable remedies, both in chronic and acute maladies ; and he advises that the operation should be principally performed in the foot ; and this he prefers to the upper extremity, as the blood cannot be impelled upwards without injury (motus et impetus sanguinis.) He particularly recommends, likewise, with the same intent, in chronic diseases more especially, labour and

exercise, with a sufficient quantity of mild potations, and temperance in eating, that thus the motion and circulation of the blood, being increased by the tonic actions of the muscles, not only 'spissitudo,' the mother of so many maladies, may be avoided, but the superfluous fluid may be dissolved into 'salsum serum,' and by increased perspiration be expelled from the body. In order, also, to prevent disease, he advises periodical bleedings at the equinoxes, without any regard to particular temperaments. But the principal duty of the physician is in all cases to follow nature, to observe the methods she pursues, and to assist her processes when they are deficient in energy.

His treatment of fever was the first approach made to the present simple and generally uninterfering plan. Looking at the frequently spontaneous and successful termination of fever, and that, after running a certain length of course, despite of every effort made to arrest it, it gradually ceased and health returned, he inferred that the plan which nature pursued ought to be imitated, and that every thing should be avoided that would at all tend to interfere with her processes. And this leads him to prohibit bleeding in fever, except very rarely; and even in inflammatory fevers, for this especial reason,—because nature, in fevers, endeavours to diminish the excess of blood by resolution into serum, and not by the evacuation of pure blood; hence the physician ought not to contravene the provident intention of nature. This is certainly not what we should have expected he would have inferred from his doctrines, as explained by himself; but we have abundant evidence for knowing that it is very generally acted upon even in the present day, and we do not believe that one practitioner in a hundred above forty years of age would dare to bleed in fevers. In intermittents, he disapproved of emetics and astringent tonics, and, above all, of the cinchona bark; having observed, what we well know, in some modifications of ague, to be perfectly correct, that not only were relapses more severe and more frequent, but that many severe affections arose from such treatment, as convulsions, dropsy, &c.

In chronic diseases, which he equally attributes to abundance and spissitude of the blood, and more especially its congestion in the viscera and the vena portæ, he also recommends venesections. For attempts are made by nature to evacuate the superfluous blood through the uterus, the hæmorrhoidal veins, the lungs, or through the nose, or congestion in the stomach, the kidneys, &c., which, in any way impeded, produces various and dangerous symptoms, and renders

blood-letting absolutely necessary; and this same mode of reasoning is carried to all local diseases, whether affecting the head, the chest, or the abdomen.

Of the medicines that are advised, though far more simple than what were employed in the times preceding him, they were still very composite, compared to what are generally prescribed now. As a refrigerant in fever, he recommended effervescent draughts, nitre or acid mixtures; and in his other prescriptions, the same intentions may usually be recognised as lead to combining of particular drugs at the present day. All very strong and powerful medicines he rejected, and condemned altogether the use of opiates, as giving only temporary relief, and aggravating the succeeding paroxysms. To tonics and astringents, when employed, he referred the œdema and dropsy in cachetic affections, and was not generally friendly to the employment of those medicines which have received the name of antispasmodics.

We do not think we can do better than finish this article with the opinion of Hoffman respecting his great rival's principles; and in a future paper we hope to lay before our readers the medical doctrines of this celebrated author.

'I do not deny,' says this great man, 'that there is much of Stahl's theory highly estimable, and greatly to be recommended to practice; *first*, because he teaches that health consists not only in the circulation of the blood, but in the due regulations also of the secretions and excretions; and, *secondly*, because, in addition to the pulse and motion of the heart and arteries, which consists in the systole and diastole, he acknowledges yet another principle of the same nature, but more subtile, residing in the solid parts, chiefly in the muscular and nervous fibres, and capable of constriction and relaxation, which he himself calls the "motus tonicus," and the ancients "tonus;" and because he has demonstrated that upon the proper construction of this tonic motion, the due performance of the natural functions depends.

'He is also among the first who recognised the difficulty with which the blood passes along the vena portæ to the liver, as a prolific cause of chronic diseases; and so much the more, that having no pulse, and, consequently, no sufficient impelling power through the substance of the liver, regurgitations and congestions took place in the viscera and hæmorrhoidal vessels, the fruitful sources of spasmodic diseases. And, lastly, no one among the moderns has so forcibly indicated the dangerous consequences of the suppression of the hæmorrhoidal flux.

'As to his practice, it is chiefly admirable for its safety, that no one following his directions could easily hurt the sick; for he was most adverse to all those powerful medicines which require great prudence in the physician, as violent purgatives, emetics, opiates, strong astringents, &c.

'*Secondly*, That he committed the cure of dangerous fevers and inflammations, for the most part, to nature, and was much averse from disturbing her processes.

'*Thirdly*, That he did not load his patients with a multitude and variety of remedies, but few and select.

'*Fourthly*, That he estimated very highly pediluvia and clysters.

'*Fifthly*, That he was highly favourable to venesection, and especially as a preventive of disease, as, indeed, the most efficient precaution against it, and particularly if employed at the times of the equinoxes.'

Such were the principal peculiarities of the the doctrines of Stahl, and the opinion delivered by Hoffman respecting them. In having given them in many instances without comment, we beg not to be understood as entirely subscribing to their justness; yet we cannot, without surprise, remember how much of them is perfectly consonant to the systems, and, what is of more importance, to the practice, of the present day. Though not prepared to advocate, at large, the Stahlian doctrines, enough, we think, has been given to prove that Stahl himself was no idle visionary, nor a mere closet physician. His powers, his ingenuity, and his industry, demand our respect, however much we may be inclined to dissent from his reasonings, or to deny his deductions.

III

(From the London Medical Repository.)

Elements of Pathology and Therapeutics, &c. Vol. II. General Therapeutics. By Caleb Hiller Parry, M. D., F. R. S., &c. &c.

The fragment of which we are about to give an account to our readers, forms an appendix to the second edition of the 'Elements of Pathology.' It was the only portion written of the proposed second volume of the author's undertaking, when he was seized with his lamented, and ultimately fatal, indisposition. Dr. Ch. Parry professes to give it in its uncor-

rected state, as left by its author: it does not therefore, become us to give more than an analysis of the opinions it conveys.

The Effects of Habits in creating Predisposition to Disease.

Dr. Parry states, that he has endeavoured, in his 'Elements,' to establish certain general principles respecting the greater number of those congeries or trains of phenomena, which constitute what are called diseases; and that he 'has attempted to shew, that in all there is one condition, either cognisable by the sense, or admissible on the clearest grounds of induction, which condition is a degree of momentum or fulness of blood, excessive with regard to the usual state of the vessels of the part, or other circumstances of the system.' After enunciating this very general proposition, which Dr. Ch. Parry will find difficult to reconcile with much of the reasoning into which he has entered in the concluding chapters of his 'Introductory Essay,'* the author proceeds to make some 'inquiries relative to the more remote causes, whether they constitute predisposition or excitement,' and commences with the subject of early education.

'4. We may first advert,' he observes, 'to that predisposition which is observable from almost the earliest periods of infancy, to attempt, by all possible means, the gratification of every want, and the removal of every present suffering.

'8. To this criminal indulgence of innate propensities during childhood may chiefly be traced those vicious habits which afterwards "grow with our growth and strengthen with our strength," are the bane of all our social virtues, and unfit us alike for present and future happiness.'

Having illustrated these propositions, the author proceeds to remark, that

'12. The parent and the nurse act with regard to the child precisely in conformity to their own habits. Accustomed rarely to look for the regulation of their conduct beyond the feelings of the present moment, they apply the same rule to that being whom Providence has entrusted to their care. They perceive that he is afflicted by the exertion of due authority; and the expressions of his afflictions are intolerable to them. All, therefore, which they are anxious to accom-

* We have deferred the analysis of these chapters (on Determination of Blood, and on Nervous Diseases,) in order that they may receive a closer and fuller examination than can be bestowed upon them within the short period which has elapsed since their publication.

plish, is their own immediate ease; and it is not till too late that they discover—if their ignorance or selfishness will permit them ever to discover—that, by their conduct, they have defeated their own purpose, and rendered inveterate those very evils which they strive to shun.'

From the subject of early indulgence, as it constitutes predisposition to disease, Dr. Parry passes, by a natural transition, to the consideration of the effects produced by a disregard to bodily exercise.

'17. Men who are nurtured in habits of self-indulgence not only bear with impatience those inconveniences which are common to the rest of mankind, but possess an acuteness of perception, which converts indifferent perceptions into actual sufferings.

'18. But even in those cases in which indolence and an assiduous escape from the common pains and irritations of life have been carried to a much less extent than just specified, they naturally lead to a state of the system incompatible with happiness or comfort.

'19. The predisposition being thus created, every thing which can concur to the eventual torment of the unhappy being through the greater part of the course of life, is, on principle, carefully superadded.

'20. Towards this end the first step is the dereliction of bodily exercise; so that when the youth, who, during boyhood, derived his chief pleasure from every variety of muscular exertion, commences that occupation which is to form the business of his future life, the exercise of his body by means of its own muscles almost wholly ceases.

'21. Hence, at the commencement of adult age, occur, in males, headach, and various affections of the brain; and, at a more advanced period, gout, dropsy, and all those complaints which are called bilious.'

The author next shews that these maladies, with the exception of gout, affect still more severely the female sex, owing to the physical restraints, and the reputed decorums of society, to which they are subjected at a still earlier age than males; and he makes some very apposite remarks upon the effects which result from confining the trunk of the body by means of stays, which prevent flexion of the spine, and consequently occasion debility, from disuse of its muscles. From the mechanical restraint thus offered to the action of the muscles of the trunk and to the descent of the diaphragm, respiration is impeded, and the functions more intimately associated with that of respiration become deranged. Hence spring, as the

author remarks, chlorosis, pulmonary consumption, and scrofula, in addition to the disorders previously alluded to.

After several just remarks upon the inefficiency of horse and carriage exercise, Dr. Parry proceeds to the subject of excess of diet.

'45. The indolence to which I have adverted is peculiarly injurious when conjoined with full meals, especially of animal ood. To such excess we are, however, habitually stimulated by every variety of taste produced by the arts of cookery, by the admixture of condiments, and by the interposition of alcohol in its different forms.

'46. This habit of indulgence in the pleasures of the table, under various modifications, especially occurs to persons rather beyond the middle periods of life; to men who have become affluent in laborious occupations, and to females who have been pampered during frequent pregnancies. From the combination of indolence and gluttony arises a degree of obesity, as offensive as it is destructive of the little mental and bodily power which the prior habits themselves would otherwise have permitted to remain.

'47. The coincidence of obesity, or plethora, with indolence, not only produces a great predisposition to disease of the alimentary canal, liver, head, heart, organs of respiration, and serous membranes, but also renders patients irrecoverable, from numerous casual disorders, which otherwise would have been attended with no important consequences.

'48. Among the practices consequent on the mental weakness already described, may be reckoned the use of wine and other modifications of alcohol as a part of constant diet; and which few persons would habitually take, were they not temporarily relieved from certain degrees of mental or bodily torpor which they have not the fortitude to sustain, or the patience to relieve, by slower but more effectual means.'

Dr Parry very justly remarks, and indeed every person of observation must have remarked, that the habitual use of moderate quantities of wine or spirits with our meals is as hurtful to the system as occasional or even frequent drunkenness. The late Dr. Gregory used to insist, in his lectures, that, of the two, the latter was much less detrimental. After alluding to the bad effects of late hours, and to the beneficial

powers of light upon the vegetable creation,* Dr. Parry proceeds to observe;—

'56. Another evil, attributed to similar causes, is the habitual exposure to the heat of large fires, and the indiscriminate use of flannel garments next the skin, both of which tend to produce excessive action of the heart, and to make the frame morbidly susceptible of the action of cold, during that exercise which is essential to health.

'58. These facts shew, beyond all dispute, the truth of the proposition, that the predisposition to the worst maladies of the animal frame grows out of those habits, which are chiefly peculiar to the condition of civilized society.

'59. The view thus given is a very cursory one. It is, however, derived from actual and long observation; and is not the less just, because, conformably to the nature of this work, I have omitted the detail of facts by which it is proved; or because, in giving it, I have neither flattered the prejudices nor soothed the weakness or the vices of mankind.

'60. To the early desuetude of restraint, and the habits of self-gratification above mentioned, we may attribute many of those intemperate indulgences of natural appetites, which act both as predisposing and exciting causes of various maladies.

'61. Inde apud mares oritur veneris cultus præcox et effrænus; quo nihil mentem magis infirmat, nihil corporis vires magis frangit, nihil articulorum, cordis, cerebri morbis, virum magis obnoxium reddit.'

Predisposition from Habits, a Cause of increased Determination.

The author very justly remarks, that, 'under a strong predisposition, a slight exciting cause is sufficient to give rise to a malady; and conversely, under a slight predisposition, a strong exciting cause is requisite.' But it is not so easy to explain in what manner the capillaries, which are the seat of disease, become predisposed, and the mode in which causes affect them. Accordingly, the diversity of the explanations which have been offered on these points have been as great as the

* The effects of light upon the animal frame has escaped the attention of pathologists in a remarkable manner. There can be little doubt that it exerts upon animals, as well as it does upon vegetables, a most beneficial influence, as respects both the growth and strength of the animal, and resistance to the causes of disease.

difficulties which beset them. The following extracts will perhaps convey to our readers some notion of Dr. Parry's opinions respecting them:—

'72. Since it appears, that, as long as organic life continues, the tonic power of such vessels contracts them within the sphere of their elastic power, which however operates to re-expand them to a certain degree, after their organic life has ceased, we have reason to infer that this tonicity acts only in a mode similar to that of muscular parts, that is, by shortening the texture possessing it, or, in a hollow part, by reducing its area.

'73. Now as there is reason to believe that capillary vessels, employed as conduits for carrying on the circulation, have powers similar to those of the large arteries, though perhaps differing as to the proportion of those powers, we have no reason, either from analogy or actual observation, to conclude, that, when unduly dilated, they owe this state to any other causes than either an increased force of dilatation within, or a defect either of tonicity or mechanical resistance.'

After adducing a few instances of local determination, which are calculated to shew that the determination is not the consequence of causes affecting the elasticity of the vessels, Dr. Parry concludes 'that the phenomenon is dependent upon a change produced upon the tonicity of the minute vessels of the part.' With respect to the nature of this change, he observes:—

'76. Under this view, the cause of predisposition in the vessels of a part is their defect of tonicity, or vital contractility; which, conformably to what has already been stated under the head of various diseases, may exist in such a degree, as to admit of such disease even under the natural impetus of the blood.

'77. Why, from the causes which have been detailed, such a disposition to local defect of tonicity should take place, we can, in many respects, at best only plausibly infer.

'78. With regard to mental causes, we see a considerable degree of analogy between their action on the tonicity of vessels through the sensorium commune, and the operation of pressure on the brain, in producing paralytic relaxation of various muscles.

'79 There is, however, another analogy of a more obvious kind; which is, the diminished contractility usually observable in muscles after they have been long or violently stimulated to action

'80. On this principle, we may reasonably explain the disposition to excessive determinations of blood, which is so apt to follow violent or long-continued increased impetus in certain parts, or the whole, of the sanguiferous system; such impetus having incapacitated the capillary vessels from that degree of vital contractility, which is necessary to the continuance of their healthy functions.'

That the change which takes place in the vessels, whether the change be one of predisposition or of actual disease, is a change of its vital condition, we readily grant—whether, also, that vital condition be termed tonicity, or called by any other name; but that the change consists of a defect of tonicity in the early stages of disease more particularly, cannot be so readily conceded, and is certainly not made out by the proofs which the author has adduced. Indeed, the sentiments contained in the paragraph following those previously quoted, instead of being a consequence of this doctrine, are better calculated to support its converse.

'81. Hence we find, that persons who, during what is called health, have a preternaturally quick or strong pulse, are much more subject to all the diseases of excessive local determination than others, whose circulation is constitutionally more moderate.

'82. In such cases, the general increased impetus, though usually to be considered as an occasional or exciting cause, acts as a cause of predisposition.

'From what has been said it seems to follow, that, whatever may be the cause of excitement, the state immediately constituting the disease in such cases, is the want of a due degree of tonicity in the capillaries immediately affected.'

Dr. Parry next inquires, 'through what media the several causes of predisposition, already specified, operate in increasing the general or local momentum of the blood.' And here he considers it obvious, 'first, that all of them, except indolence, immediately produce an increased action of the heart, and consequently, for the most part, an increased general momentum of blood. Secondly, indolence and full living produce a tendency to general plethora, or fulness of blood.'

'86. The second state shews itself by the circumstances of the pulse, venous distension, general heat, and frequently obesity of the patient relatively to that of other persons of the same age, sex, and bulk.

'87. Here it is necessary to decide in what sense the term plethora is employed:

'89. It seems to apply only to the existence, in any vessel or vessels, of such a quantity of blood, as dilates it or them beyond the degree which is usual in the same persons, or others of the same bulk, under other circumscances.'

After stating that the accounts we possess of the experiments which have been made on the transfusion of the blood are favourable to the inference that general plethora tends to the production of local disease, Dr. Parry proceeds to observe :—

'97. When we consider the sanguiferous system, not merely as a set of dead tubes, but as a living machine, having in itself powers of accommodation, whether morbific or salutary, to the relative situation in which it is placed, we cannot wonder at all those circumstances of affection or action, which result from the influence of external agents, modified by those inherent powers.

'98. To these affections or actions, the blood itself seems to be a peculiar stimulus, whether we consider that stimulus as operating more remotely, through the brain, or more directly on the vascular system itself, through which it more or less constantly and immediately circulates.

'99. Although, therefore, we have no evidence that the arterial system in any way actively contributes to the mechanical circulation of the blood in a state of health, or that, in a similar state, the capillaries exert any propulsive power; yet there can be no doubt that if either of these systems, in any part, comes to be preternaturally distended with blood, they have, under certain circumstances, severally the power of contracting themselves to the healthy degree, and of thus expelling the superfluous blood, which circulated through, them.

'100. If, then, we can suppose the dilating force to be increased, as it must be in proportion to the increased quantity of blood which constitutes it, and a tonic re-action takes place in any part of the arterial system, so that the arteries of that part return to their usual diameter; it is evident that, the quantity of blood in the whole system remaining the same, certain other parts, or the whole remainder of the system, must have its capacity and quantity of blood proportionably augmented.

101. This condition, the velocity of the blood being given, implies an increased momentum in such dilated part or parts; and thus we may conceive a reason, why a state of plethora,

produced by the various habits above mentioned, may give occasion to local excessive determinations of blood, exclusively of any perceptible increased action of the heart.

'102. Experiment indeed demonstrates that the disposition to contraction in the larger arteries is not, under apparently similar circumstances, every where alike; so that they will contract unequally and suddenly, and, in this way, may be supposed to serve for a moment as hearts to particular parts of the capillaries.

'103. This we might suppose especially to happen to any part in which the capillaries were peculiarly weak and unresisting; so that there should be the coincidence of increased contraction of the artery, with diminished contraction in the capillaries to which it led.

'104. In this theory there is some speciousness; but the question is whether there be equal truth; since, on the contrary, we find that all the larger discoverable arteries leading to parts either inflamed, or similarly disordered, are not only not contracted, but actually enlarged.

That there should be increased contraction of the artery beyond its natural diameter, with diminished contraction of the capillaries proceeding from it (103,) is not a probable coincidence, particularly as respects the absolute area of the vessels; since we have no satisfactory proof that such coincidence, has been observed, and much difficulty to believe the possibility of its existence. But, that the larger arteries leading to parts either inflamed or similarly disordered (104,) are not contracted, but actually enlarged, is certainly the fact, so far as observation is concerned, and is exactly the condition which, *a priori*, we would be led to expect. Dr. Parry remarks, in continuation—

'105. I found that where, either from a partial ligature, or from a natural cause, the area of an artery was considerably diminished, the pulse in the artery beyond that part was so far from being stronger, that it was greatly enfeebled.

'106. Whether any alternate dilatation and contraction takes place in arteries preternaturally distended for the purpose of supplying inflamed parts, actual observation has not enabled me to decide.

'108. Since, however, in a carotid considerably dilated by a ligature of the corresponding carotid on the opposite side, no such alternate motion was perceivable, we have strong analogical reason for concluding, that no alternation of this kind

occurs in arteries unusually distended in consequence of leading to inflamed parts.

'109. We therefore want better evidence than any which I am able to adduce, as to the cause of many simply local increased determinations of blood, arising under a plethoric state of the constitution; although the fact itself seems to have in its favour the concurrent testimony of medical practitioners.

'110. It seems, however, as if the more immediate and ordinary influence of a certain degree of undue plethora were on the heart itself, which is thereby stimulated to increased action, and therefore is the great cause of an excessive momentum throughout the sanguiferous system, and, in the mode already explained, of an undue determination to certain parts of the system of the capillaries.

'111. What share an accidental, or habitual, plethora of any or all the veins may have in producing an obstruction to the free evacuation of certain parts, or the whole of the arterial system, it is difficult to determine.

'112. The existence of a venous plethora or fulness is supposed to arise, accidentally, from various causes; and it is believed to exist, constitutionally, after a certain period of life, when the balance of the sanguiferous system is so changed, that the preponderance, which, at an earlier period, occurred in the magnitude of the arteries, is now transferred to the veins.'

Dr. Parry has here overlooked a condition of the system much insisted upon by pathologists, viz. that plethora may, and actually does exist, without an increase of power in the moving or circulating organs; nay, that it more frequently is accompanied with a diminution of this power, and that it even results from such a state. The dimunition of power accompanying plethora may relate more particularly to the action of the heart, of the veins, or of the system of the vena portæ; but whatever relation it may hold with particular parts of the sanguiferous system, its frequent relation with plethora is undoubted. If this proposition be admitted, the universality of the proposition in one of the paragraphs (110) now quoted, cannnot be allowed.

Our author next considers plethora in the veins in relation to predisposition to disease; and he here takes occasion to remark upon the part which the veins perform in the circulation of the blood, and in occasioning local determination. As we find but little, at this place, which is not amongst the most

familiar objects of our knowledge, we shall not detain our readers with many more extracts.

'125. To me it seems that authors are far from attributing to the left ventricle of the heart a sufficient power of propelling the blood through the capillaries and veins.'

'131. Were not the propulsory power of the ventricle sufficient for the ordinary purposes of healthy circulation, how could that circulation so uniformly continue during sleep, when there is no alternate movement and rest of any muscles, except those of respiration; and how, in asphyxia, happens it that the whole venous circulation is renewed, as soon as the action of the heart is restored, and no sooner?'

'133. That the influence of the left ventricle is capable of reaching the smaller veins during both ordinary and languid circulation, appears from the microscopical observations on water-newts, green frogs, the incubated eggs of fowls, and tadpoles, by Spallanzani; who found that, in innumerable veins, the venous blood was evidently accelerated during the systole of the ventricle, and retarded during the diastole.

'134. Mr. Hunter also remarks, that blood taken from the veins near the extremities, not unfrequently flows with alternate jets, as from arteries; an evident proof of a similar influence of the ventricle on vessels recently continued from the extremities of arteries.'

'136. In the former volume of this work, I suggested the possibility, that the expansion and consequent vacuum of the right auricle might have some share in producing a mechanical entrance of the blood from the venæ cavæ into that cavity; and to this source some persons might attribute the occasional jet of blood in the veins.

'137. If, however, this cause exist at all, its influence must be very slight; since, first, although the auricle is well known to act after other parts of the heart have become quiescent, yet, in a great variety of cases, that cavity, in common with the others, is found empty of blood; and, secondly, because, conformably to the observations of Mr. Hunter already quoted, the jet of blood is most perceptible, the farther, in the course of circulation, the vein is from the heart. So also in the microscopical observations of Spallanzani on the water-newt, that author saw that the jet of venous blood, corresponding with the systole of the ventricle, diminished as the vein approached the heart.

'Although, therefore, some coincident powers, at which I have already hinted, may assist the venous circulation, there seems no just ground to doubt, that it is the left ventricle

which mainly effects the circulation of the blood throughout its entire course.

· 138. It is worthy of remark, that many of those authors who deny all influence of the heart or arteries on the venous circulation, yet attribute certain morbid effects, as hæmorrhages and serous effusions, to that very influence.

' 139. This conclusion is probably well founded; and the effort seems to be the natural, though probably not the most beneficial means, of removing that plethora which occasioned it.

' 140. We can easily conceive, that such a plethora in the veins, opposing a great resistance to the advance of the arterial blood, may stimulate the heart to a proportionably strong, sharp, or frequent action.'

We have given, for the benefit of those of our readers who may have the first edition of the ' Elements of Pathology,' a very full analysis of the fragment contained in the Appendix to the second.

MONTHLY SUMMARY

OF PRACTICAL MEDICINE.

I. ANATOMY AND PHYSIOLOGY.

M. Majendie *on the Sensibility of the Nerves of the Senses.*

1. *On the Sensibility of the Nerves of the Senses.*—M. Magendie, at a recent meeting of the Institute, communicated verbally some observations on this subject. He is of opinion that the sensibility of the nerves of the senses is entirely relative to the kind of impression which they are destined to communicate; that the retina, for example, is only sensible to light, and that it may be pressed, pricked, or torn, in animals, without exciting pain. A short time ago, in operating for cataract on a woman, M. Magendie accidentally touched the retina, without his patient manifesting any sensation. Having afterwards touched the retina of both eyes, he ascertained, in the most satisfactory manner, that this part is as insensible in man as in other animals. The woman did well.—*Bulletin des Sciences Medicales*, Mars.

2. *On the Galvanic Phenomena which accompany the Acupuncturation.*—M. Pelletan has ascertained, by means of the galvanometre of M. Bicquerel, that perceptible quantities of this fluid are always disengaged by a needle plunged into a part of the human body affected with pain. The quantity is extremely small; perhaps, says M. Pelletan, not equalling the hundredth part of what is obtained from a single plate of a common voltaic pile. Nevertheless its effects may be rendered sensible; for which purpose, it is sufficient to make the needle inserted into the affected part communicate with the mouth, by means of a metallic wire. M. Pelletan thinks these galvanic phenomena unconnected with the curative effects of the operation; which opinion is founded upon the circumstance of the relief obtained by the patient being in no case in proportion to the quantity of the fluid disengaged; and that very marked effects result from the acupuncturation, even with a needle terminated by a non-conductor. No perceptible difference presents itself with regard to the degree of relief between the use of needles ending in non-conductors, and those so arranged as to allow the electricity to pass off. It is asserted by M. Pouillet, that no galvanic phenomena present themselves when needles made of platinum or gold are employed; from which he infers that, in the cases alluded to, the effects were the result of the oxidation of the metal. M. Pelletan has seen incontestible success following the use of the acapuncturation, particularly in rheumatic affections.—*Ibid.* February.

Mr. Davies, *on the Pathology of Phlegmasia Dolens.*

It will be seen from the previous part of the history of the present case, published in the preceding Number of the Repository, that the subject of it was seized, in about three weeks after her confinement, with an excruciating pain in the left loin and hip, and that this pain darted down into the ham and leg of the same side, the latter of which became insensible, and ultimately dead and sphacelated, so as to require amputation. The limb, above the knee, presented all the appearances characterising phlegmasia dolens. It was considerably swelled, cold, and knotty. Below the knee, the circulation became obstructed in the veins almost immediately after the first attack, and marks of approaching gangrene soon made their appearance. In a week after, sloughing took place about the ankle and foot, which extended so rapidly as

to destroy, in two days, all the soft parts, from the toes to two-thirds up the leg. The limb was removed, as the only chance of saving the patient's life; and for a week after the operation she had no favourable symptoms. The amputated limb was examined, and the veins were found highly inflamed, and the blood coagulated in them throughout. I now continue the history of the case from the date at which the patient was stated to be doing well. Mr. B. Cooper saw her on the 20th of May.

21st.—There were no bad symptoms whatever. The patient's appetite was good; and she had had a comfortable sleep in the night. The stump felt quite comfortable; but as there was a little fluctuation under the dressing, it was thought better to remove it. On the straps being removed, it was found that the edges of the wound had not united. The discharge was not great, and it appeared very healthy for the first dressing. Granulations were shooting out over all the surface of the wound, and the appearance of the stump was altogether favourable. All the ligatures came away at this dressing. The edges of the wound were again drawn slightly together with straps of adhesive plaster, leaving sufficient room between them for the exit of the discharge, and the end of the stump was covered over with a pledget of lint, on which was spread common cerate. The cascarilla medicine was continued, with a little opiate at night, and the diet was to be mild and nourishing.

22d.—In the morning the patient was as well as on the day before, but towards evening she had a little tendency to diarrhœa; otherwise she felt very comfortable in every respect. There was a little discharge of healthy pus from the wound. The pledget of lint was removed; but as there was a sufficient outlet for the discharge, the adhesive straps were left. The end of the stump was covered with a soft bread poultice over the plaster. She was ordered to take the chalk mixture, with a little laudanum, for the diarrhœa.

23d.—At eleven in the morning, she felt more irritable than she had done since the operation. The pulse was about 120, and rather weaker than before. The diarrhœa had ceased, and the bowels were comfortable. She complained of no pain any where, but her spirits were depressed. Her appetite, notwithstanding, was tolerably good, and she had slept several hours in the night. The tongue was perfectly clean, and she complained of no thirst.

The dressings were removed from the stump. The granulations and the discharge appeared as healthy as any I have

ever seen. The limb above felt cool, and appeared quite free from inflammation; but there was a swelling of the labium pudendi of that side, of the size of half a small orange. I pressed the inside of the thigh and groin, but she did not complain of any soreness. The surface of the wound, although appearing so healthy, was extremely tender. There was a small coagulum hanging out of the femoral vein.

The wound having been cleaned, a soft bread poultice was laid over the end of the stump; after the application of which, during the time we staid in the house, she felt very comfortable. There were no symptoms now indicating any sudden change. The pulse was by no means bad; the head was not in any way affected; nor was there any pain worthy of notice in any part of the body. The tongue, as already mentioned, was perfectly clean and moist.

Mr. L'Estrange and myself had not left the house half an hour before the patient was taken with a violent shaking of the whole system. This affection came on quite suddenly, while she expressed herself perfectly free from pain; but as soon as she was seized with it, she complained of an insufferable oppression at the heart and pit of the stomach. As Mr. L'Estrange and myself were both out of the way when her friends sent for us, our assistant went to see her, and gave her a drachm of laudanum in camphor mixture. As soon as I arrived—about half an hour after the commencement of the attack—I was greatly surprised to see the patient apparently within five minutes of her death. She was quite insensible and speechless, gasping once every fifteen or twenty seconds only; the eyes were motionless, and drawn upwards; there was no pulse to be felt at the wrist, and the shaking had entirely ceased.

There was now very little hope of her living many minutes; but very anxious to try something, I instantly began to pour some brandy into the stomach. I was able to get liquid down by little and little; and after about a quarter of an hour, when she had taken about four ounces of it, the pulse could be feebly felt at the wrist; otherwise she remained just in the the same state. Unless the brandy was continually given, the pulse immediately sank. Shortly, my partner, and my friend, Mr. Daniel, of Bishopsgate, came to my assistance. We were determined to keep up life as long as stimulants would do it; we therefore gave her, alternately with the brandy, a mixture of æther, spirit of ammonia, and spirit of nitre, as fast as we could get it down. We removed the poultice also from the stump, and dressed it with a strong solution of

opium in water, with the addition of spirit of wine; and the chest was well rubbed with turpentine. These powerful stimulants raised the pulse a little, and in about an hour the shaking began to return. In about two hours from the commencement of the exhibition of the stimuli, the patient was considerably recovered. She was now able to speak, and to breathe comparatively freely. The pulse was much improved; but to keep it up, it was necessary to continue the brandy or the æther mixture, in small quantities, every two or three minutes. She was by this time a good deal under the influence of opium. In half an hour more she was much improved; so well, indeed, was she, that we thought ourselves justified in leaving her for a short time, giving orders previously to continue the brandy frequently.

During the two hours and a half we were with the patient, she took about a pint of brandy, an ounce of rectified æther, half an ounce of spirit of ammonia, and half an ounce of spirit of nitre. We left her at half-past three. During the rest of the afternoon and the evening she continued tolerably comfortable. She slept a good many hours altogether, and took arrow-root at intervals. A table-spoonful of brandy was given to her frequently, but the æther mixture was omitted after the heart became able to continue its action without its assistance.

The stump was dressed in the evening with a weaker solution of opium. At this time the discharge consisted of pure, healthy pus, and the granulations appeared as healthy as before. The opium had taken away considerably the irritability of the wound. There was nothing in the appearance of the wound, or of the limb above it, to account for the extraordinary symptoms which were manifested during the attack.

I saw the patient between twelve and one at night. She was then asleep. Her pulse was good, considering the nature of her case, and her breathing was easy. She was evidently under the influence of opium. She had had a stool of a perfectly natural colour.

She was ordered to have arrow-root or sago, with a little brandy in it, frequently in the course of the night, and to drink a little brandy and water at intervals.

She continued in a very comfortable state during the night; she slept three hours without intermission, besides several short naps both before and after. She took her sago and brandy with a degree of relish, and she complained of no particular pain in any part of the body. These comparatively favourable appearances continued till about seven o'clock in the morning of the 24th, when she was seized in the same

manner as on the day before. I was by her bed-side in less than ten minutes from the commencement of the attack. She had all the symptoms which have been already described, as relating to the previous attack. I had recourse to the same sort of stimulants. After every spoonful, the pulse could be felt at the wrist for about half a minute but it sunk again almost before I could have time to pour more down. I continued the stimulus for an hour with a determined perseverance, but all I could do was no more than to keep the heart from ceasing entirely to act. The chest was rubbed, in the meantime, with spirits of turpentine; and the wound was again dressed with the opiate lotion. Even now it appeared healthy. The discharge consisted of healthy pus, and there was not the least appearance of disease on any part of the surface of the stump.

In about an hour and a half she became incapable of swallowing. I could think of no further means to be tried, except transfusing blood into her vessels; but as the effect and fitness of that remedy was doubtful, and as her friends were not inclined she should be "tortured" even by giving her the stimulants, I did not propose transfusion. She died in about half an hour after she became unable to swallow.

Dissection.—The body was examined forty hours after death. As the examination was necessarily performed late at night, we could not inspect the body very minutely. The fat and muscles were remarkably oily throughout the body. The muscles were very flabby. The femoral vein of the side affected was inflamed in the highest degree, and its coats thickened. It was full of coagulated blood. This state of the vein extended throughout the iliac, into the cava, nearly as high as the diaphragm. The disease of the vein did not descend at all on the opposite side, from its bifurcation. All the small veins, as far as we could perceive, of the diseased limb, were in a similar state; but we must infer that some of them were pervious, otherwise the blood could not have returned from the arteries. The inner coats of the arteries were red throughout the body; but as I had often noticed this appearance in subjects who died of phthisis, and several other chronic diseases, where no symptoms of inflammation of the vessels existed during life, I did not consider it inflammation in this instance, especially as there were no symptoms to indicate such an affection before death; for the violent shaking with which the patient was seized was not a rigor, similar to that which takes place at the commencement of fever or of inflammation, but a nervous affection more like attendant on chorea. This affection of the arteries is more particularly

to be observed in subjects who have been considerably debilitated, either by depletion or by disease, before death. Whether it may be owing to the vasa vasorum not possessing a sufficient power to empty themselves during dying, I am not able to tell. The inner surface of the stomach was remarkably pale. The large quantity of stimulating substances poured into the organ before death did not in the least inflame any part of it. The texture of the uterus was very soft, so that the finger might have been easily pushed through it; and its internal surface appeared as if, in some degree, abraded. The thoracic viscera were healthy; so were also the intestines. The brain was not examined, for want of time.

I have related simply the history of the case throughout, with the principal morbid appearances after death. It is difficult to account for the sudden change in the state of the patient, whilst the wound appeared so healthy to the last. We suspected at first that the extremity of one of the nerves might be irritated by some part of the poultice applied to the stump; but after this was removed, and the wound washed quite clean, the symptoms continued for two hours or more, and returned the following morning, while the opium lotion was to it. From the history of this case, as well as from another case which I have since seen, and which bears a striking resemblance to the present, I am disposed to think that the nerves of the limb are the parts which constitute the first seat of disease. The attack is instantaneous, and the pain excruciating; but the swelling does not take place until many hours after. If the inflammation of the vein were owing to the pressure of the child before, or during delivery, the disease ought to manifest itself soon after; whereas, in the present case, it did not make its appearance for three weeks after delivery. I have seen a few cases of the disease, in an inferior degree, and in all these it did not shew itself for some days after parturition. The mobid *appearances* after death are decidedly in the vein; and, according to our present knowledge, to go beyond that, to seek for the original seat of the disease, would be only an *inference* drawn from the first phenomena manifested by the malady.

Any further remarks which I should be able to make on the case, would throw no more light upon the nature of the disease, than the perusal of the history of it alone will do. I shall, therefore, say no more, than that I am much indebted to Mr. B. Cooper, and several other friends, for their kind advice and assistance in the treatment of the present case, and in the examination of the body.—*Edinburgh Med. and Surg. Journal.*

II. SURGERY AND MIDWIFERY.

Mr. Syme *on the Treatment of Incised Wounds.*

Any proposal at this time of day to alter the method usually followed in treating incised wounds, may be regarded as unnecessary and presumptuous. British surgeons, I know, pique themselves upon the excellence of their practice in this respect, and will hardly be induced to abandon the old established customs in which they have been educated. But as all improvement would be at an end were such considerations allowed to silence the voice of conviction, the following remarks are, with all deference, submitted to the public.

When it was the fashion of those who practised according to rule, to treat all wounds however simple and disposed to heal, with an elaborate succession of so called—mundifying—digesting—incarning and cicatrizing applications, most of which were more or less escharotic in their nature, but at all events effectually prevented by their presence, any union except that established by granulation—it is no wonder that the results of a very different plan followed by quacks, old women and other irregular practitioners, who trusted entirely to sucking the wound—balsams applied externally—and incantations—made a deep impression upon people in general; and even the members of our own profession, who were at length induced not only to learn the proceedings in question, but also to adopt them for the benefit of their own patients.

The success met with was great beyond expectation. It was discovered that wounds could be healed much more simply than had been imagined—and union by the first intention became so favourite an experiment with the learned as to afford subject of ridicule to the vulgar.

Many succeeding anatomists and surgeons have investigated the action concerned in the formation of primary union. But it is odd enough, that while our ideas have been gradually becoming more and more enlightened as to the process of simple adhesion, our practice has suffered little alteration, and still continues to be tinctured with much superstition and barbarism.

Every incised wound whether accidentally or intentionally inflicted, after being dressed according to the surgeon's fancy, is bound up with a long bandage tightly and curiously turned. And although the patient soon complains of heat, pain and oppression, all his intercession for relief are of no avail; the

bandage must not be disturbed until the morning of the fourth day, when the long wished for, much dreaded dressing is to take place. Now it is easy enough to understand why the quacks of old tied up their patients' wounds for a definite period. They wished to keep at a distance the injurious applications so much confided in by the regular faculty; and for this purpose pretended, that their balsams and incantations could work successfully only in secret,—at the same time prudence dictating the propriety of restraining anxiety and impatience no longer than what was absolutely necessary, while experience taught them, that union by the first intention, if it happens at all, does so within three days;—they fixed upon this as the term of their mysterious process.

But *we* know that adhesion depends on a peculiar living action,—not upon the virtues of balsams or superstitious observances; and why then do we still obstinately defer the second dressing of wounds until the seventy-second hour after their infliction?

It may be said by those who do not feel prepared to answer this question, the practice succeeded of old, it does so now; and we are satisfied without troubling ourselves in seeking for reasons.

But is the practice really successful? Does the surgeon uniformly or frequently find, when the dressings are first undone, that the wound is healed? To both quesstions, I answer decidedly in the negative.

When the surgeon with his apprentices, the patient with his friends, are all assembled together on the morning of the fourth day, an anxious and painful scene ensues. Plasters and bandages, warm water and sponges, being duly prepared, the bandage is cautiously undone—no easy matter frequently, when dried blood has glued its different crossings together, and fixed the pins into their places—then compress by compress is taken away, until the wound lies exposed to view—when the surgeon and bystanders sometimes flatter themselves that it has united by the first intention; but a gush of fetid pus for the most part soon puts an end to their premature congratulations. It more generally happens, however, that the pus having separated its lips, lies in considerable quantity between the wound and plaster immediately superjacent. In both cases, it is plain, that the corresponding surfaces, instead of being united by primary adhesion, must be as completely detached as if caddis had been, *more Gallico*, interposed bethem. Indeed the French practice is much more prudent

than our own; for laying their account with the formation of pus, they provide a drain for its discharge, and thus prevent the formation of those artificial, frequently extensive and undermining abscesses, which so often result from injudicious attempts to obtain adhesion by the first intention.

That in this description I have not made matters worse than they really are, will be allowed by all who have seen much operative practice. Many students have assured me, than in the whole course of their hospital attendance, they never saw an instance of union by the first intention,—except in cases of cancer or hair-lip, and venesection. And I have ascertained that some do not know what is properly meant by this term, saying for instance, that a stump which got well in the course of three or four weeks without sloughing or exfoliation, healed by the first intention, though it may have been suppurating freely all along.

As to the success which is said to have attended the close system of dressing, when employed long ago by the quacks, I am inclined to think that there is much allowance to be made for the exaggeration of historians accustomed to the cruel, tedious, and injurious practices of men, who, though very learned and well meaning, certainly were no surgeons. But at the same time I do believe, that union by the first intention happened more frequently in the days of Taliacotius than it does at present—for the great, I may say infallible preventive of adhesion, I mean adhesive plaster, was not then invented. I do not mean to say, that a narrow strap or two placed across a long wound will certainly oppose its union by the first intention—but I do maintain, that if the straps be applied properly, that is, in an imbricated manner, as botanists would say, or one overlapping the other, so as to cover the wound from end to end, the surgeon may rest perfectly satisfied that in all human probability a goodly abscess will be formed within the statutory period, viz. three days.*

Blood being effused from the raw surfaces, and having no opportunity of escaping, causes separation and distension. Adhesion is consequently prevented, and the parts are roused to a strong action; then the patient complains of pain and heat, with thirst, and all the other symptoms of fever—pus is formed and the abscess is completed.

It is not necessary for the prevention of adhesion, that *blood* should be effused, since the uniting action is always for the

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* The diagonal and longitudinal straps which it pleases some surgeons to apply, over and above, I am inclined to consider unnecessary and wasteful.

first day, and part at least of the second, attended with copious discharge of thin serous matter, which acts quite as effectually in preventing the surfaces from adhering, that is to say, if they be of any considerable extent; for in very small wounds primary union happens, do what we will to oppose it.

This copious and continued discharge of serous fluid during the adhesive process, is what I am most anxious to impress upon the reader; for if it be kept in mind, there can be little difficulty in perceiving why the sealing up of wounds should be the most certain means of keeping them open, or in determining as to the best means for conducing to a different result.

It is plain, that in the first instance no effort should be made to close the orifice completely—that pressure should be directed to the bottom rather than the outlet of the wound—that blood should be allowed to crust over the lips—for though blood may be the best, that is the least hurtful balsam, I have often known it confine the serous discharges, and so prevent union—and that the orifice should he wiped and kept dry as long as it exudes any moisture.

For fulfilling these indications, I would recommend in the first place, that when means are required for keeping the cut edges in contact, stitches should be preferred to adhesive plaster, since their effect is exerted at considerable depth, while they offer little or no resistance to the exit of fluid. Some surgeons employ stitches and plasters together, but this plan I dislike; for plasters acting only on the surface, always tend powerfully to close the lips, or even turn them inwards, while they not only effect no deep pressure, but even render the parts concerned more loose and disposed for the formation of sinuses; and stitches, if put in close enough, may always be rendered equivalent to the requisite contraction. It may be noticed, however, that a little gaping of the edges is by no means hurtful in the first instance, since it ensures a thorough discharge, and is rectified as soon as adhesion begins.

Secondly, I would advise the disuse of all long, complicated bandages, which cannot be tightened or slackened in part, and removed without disturbing the patient.

Compresses having been laid along the sides of the wound, it will be easy to effect pressure by very simple means, independently of long circular rollers For instance, in wounds of the trunk, what can be more powerful or manageable than a broad piece of linen, but long enough to cross a little over the

breast, and having its two ends torn longitudinally into three or four portions, any one of which may be tightened or slackened as occasion requires, while the whole may be thrown back at a moment's notice?

For wounds of the extremities, a similar bandage, on a smaller scale, will answer equally well; and as for stumps, I beg to recommend a very similar contrivance, that has often saved me much trouble. A roller having been put on as usual, from above downwards, until it has come within a few inches of the stump, it should be fastened away; and then a few narrow strips of cloth being pinned or otherwise attached on each side, nothing remains to be done but tying them to each other across the face of the stump.

Lastly, I would advise that the surgeon should apply dry caddis over the wound, as often as the least moisture is perceived.

If these directions be observed, I feel satisfied, from my own experience, that union by the first intention will become an ordinary occurrence. And of how much consequence this is in all cases of wounds, but particularly in such as are complicated with fracture of bones, surgeons need not be told by me.—*Edinburgh Medical and Surgical Journal.*

Dr. Belcher *on the Application of Opium in Solution to Lacerated Wounds.*

I have been induced to make a few observations on the good effects of opium in solution applied to lacerations of tendinous parts, from having witnessed several cases of those injuries, where I think tetanus most probably would have supervened, if it had not been for the timely use of this powerful therapeutic agent, shortly after the receipt of the injury, and continued until the commencement of the suppurative stage. One case in particular, has lately presented itself to my observation, which has made a considerable impression on my mind as to the utility of this application in preventing the onset of the tetanic spasm. A healthy, robust man, who had been attending a bolting-mill in this neighbourhood, got his left hand into a wheel which was moving with considerable velocity: he luckily extricated himself, having the third phalanx of the index, and the second and third of the middle fingers, literally ground to pieces, with considerable laceration of the palmar aponeurosis and some of the flexor ten-

dons. Amputation of the injured phalanges appearing indispensable, I performed it immediately, and dressed the wounds with dossils dipped in opiate solution (gr. iv. to ʒss.,) prescribed an anodyne diaphoretic draught at bed-time, and a saline purge in the morning. This patient passed the subsequent night free from spasmodic irritation, so commonly attendant on wounds of this class. The dressings were repea ed until inflammatory action developed itself in the wound, when an emollient cataplasm was substituted, the patient continuing to enjoy freedom from pain and spasmodic startings. The anodyne draught was continued every night. The wound suppurated; portions of tendon and aponeurosis sloughed; granulation and cicatrisation succeeded, without the slightest tendency to spasmodic affection.

I recollect having seen, when a pupil, two remarkable cases of extensive lacerations of the gastrocnemii muscles and tendo Achillis, occasioned by a loaded cart-wheel rolling over the limb; one of these patients was of the sthenic, the other of the asthenic, diathesis. The *latter* was dressed with solution of opium immediately after the receipt of the injury; and the subsequent night was spent without pain, uneasiness, or starting in the wound, the patient having slept comfortably. The opiate dressings and draught were continued; when inflammation set in, the emollient cataplasm was applied; and by persevering in this plan for some days, the patient quickly recovered, without constitutional disturbance. This was a case that any person who had seen it would have dreaded the approach of tetanus. The *former* patient was robust, and of the plethoric temperament so usually the subject of tetanus. His wound was nearly similar in situation and extent to the former. He was treated by a different Surgeon, with simple dressings and emollient cataplasms. He suffered much pain and spasmodic startings from the date of the injury; considerable and darting pains shooting up along the course of the absorbents to the inguinal glands, some of tetanus devolved themselves, which in thirty six hours proved fatal.

I can also call to my recollection two cases of compound dislocation of the thumb at its metacarpal joint (an injury frequently followed by tetanus,) where the opiate dressings were applied, accompanied by a splint to keep the parts *in situ*. An anodyne was given at night, and a purge in the morning; quietude enjoined. By a continuance of this plan of treatment, the patients recovered, without any disposition to spasmodic affection.

I witnessed another case of this accident where opium

had not a fair trial; tetanus supervened, and destroyed the patient.

Mr. Todd, of Dublin, was in the habit of applying opiate dressings to wounds of this description, at the Richmond Hospital, in that city, and with the very best effects. In one case, where the thumb, index finger, and part of the palm of the right hand, were shattered by the bursting of a blunderbuss, amputation was performed shortly after the receipt of the injury, at the carpal joints of the metacarpal bones of the index and thumb; the wound and neighbouring laceration was dressed with lint dipped in solution of opium; the antimonial anodyne at night, and saline purge in the morning, were exhibited. This plan was perseverved in, and the patient recovered without a bad symptom, scarcely requiring a poultice. Mr. T. expressed his conviction to the pupils that tetanus would most probably have supervened in this instance, if it had not been for the effects of opium in warding off nervous irritation.

The results of these several cases have pretty strongly confirmed my opinion of the utility of opium as a *preventive* of tetanus in many cases of this description, where, without its early and continued use, this intractable disease would have attacked and destroyed the unfortunate patient; and I conceive it very probable that if opium, constitutionally administered and locally applied, got a fair trial, and was more generally used by Practitioners in those particular injuries immediately after their receipt, we would have much fewer cases of traumatic tetanus to contend with as their sequelæ. I should also imagine this plan applicable to gunshot injuries in similar parts; but I cannot speak of them from experience.

There is another form of injury, attended in many cases with the most melancholy and fatal effects, (I allude to those slight scratches, too many fatal examples of which have occurred within the last few years,) where I conceive it probable that opium, given in large doses, and repeated so as to keep the system under its influence for a few days after the receipt of the scratch, may be instrumental in warding off those dreadful symptoms which so frequently ensue, as I believe it is generally supposed that the nervous system in those cases is particularly affected. From the intense pain which the patient uniformly suffers, might not placing the system under the effects of opium immediately, act as a preventive? it is worthy of trial, as all remedies hitherto tried when this disease *has set in* have failed in giving relief in many cases.

The experience of Dr. Colles in the melancholy case of the late Professor Dease, of Dublin, has proved to us that opium was of no avail when the disease *had set in*. From the excellent effects of opium in those cases which I have before related, I think it rational to infer similar good effects in other injuries which are likely to produce nervous irritation.

P S.—While lately serving in his Majesty's navy, in 1823, I witnessed a remarkable and extensive *laceration* of the flexer tendons at the wrist by an iron hook. In this case, opium was applied with excellent effects. Tetanus did not supervene.—*London Medical Repository*

III. PATHOLOGY AND THERAPEUTICS.

M. Peschier *on the Cure of the Goitre.*

Being frequently called upon to administer aid in cases of goitre, M. Peschier, in 1816, endeavoured to separate from burnt sponge the substance which conferred on it its useful properties; and thinking this might be the alkali, was induced to administer solution of subcarbonate of soda, more or less disguised by other substances. This attempt was accompanied by complete success, which has never yet been falsified. The effect was such, that, M. Peschier says, at Aubonne, (Canton de Vaud,) and the neighbouring places, the remedy soon acquired a considerable name for its power of dispelling, or considerably diminishing, the goitre; and he refers to the evidence which may be abundantly obtained there, for confirmation. One or two cases are, however, quoted;—Jan. 1. A young girl (Aubonne Isaline Cretigny,) fourteen years of age, well formed for her age, was brought to him for assistance. She had a goitre large enough to give the neck the appearance of a cylinder of the diameter of the head. Subcarbonate of soda was administered in the proportion of two gros (118 grains) each day. At the end of the twentieth day the goitre was so far diminished, and the girl's appearance so much altered, that she could scarcely be known for the same person. This was a particularly favourable case.

In ordinary cases, when the goitre is not connected with any general or constitutional affection, M. Peschier dissolves from two gros to half an ounce of subcarbonate of soda in eight ounces of water, and directs that a tablespoonful of this solution should be taken twice a day in half a glass of wine,

or sugar and water. Persons who have had no objection, have taken the pure solution.

In cases where the enlargement of the thyroid gland has been accompanied by the same affection of the lymphatic ganglions of the neck, bitter and tonic roots, such as gentian, &c., have been added to the alkali; and also purgatives administered, such as rhubarb and senna, with anise or fennel seeds, the whole infused in a bottle of good wine, of which a quarter of a glass has been taken two or three times a day.

In one case, among many others, relief was afforded to a young person who had several enlarged glands on each side of the neck, even after it had been proposed to extirpate them by a surgical operation, the remedy being continued for several months. In other cases, very old suppurations of the glands have been corrected and cured, after they had resisted various modes of treatment.

When, in 1820, Dr. Coindet proposed the use of iodine, M. Peschier also applied it, but, except in one instance, always with the solution of soda. In one case, where tincture of iodine alone was used, the disease resisted the medicine for six weeks, and at the end of that time had become hard, producing a sensation of strangulation. Leaving off the use of iodine, Dr. Peschier first gave purgatives, and then alkali, and attained the end required.

From that time M. Peschier says he has resumed the exclusive use of subcarbonate of soda, and always with success. He suggests the propriety of observing, whether the inhabitants of those places where the water is slightly alkaline are not less liable to goitre than in other places; and whether mixing habitually a small quantity of soda in the water intended to be drunk would not entirely prevent the occurrence of this disease in places where it is now most readily manifested.—*London Medical Repository.*